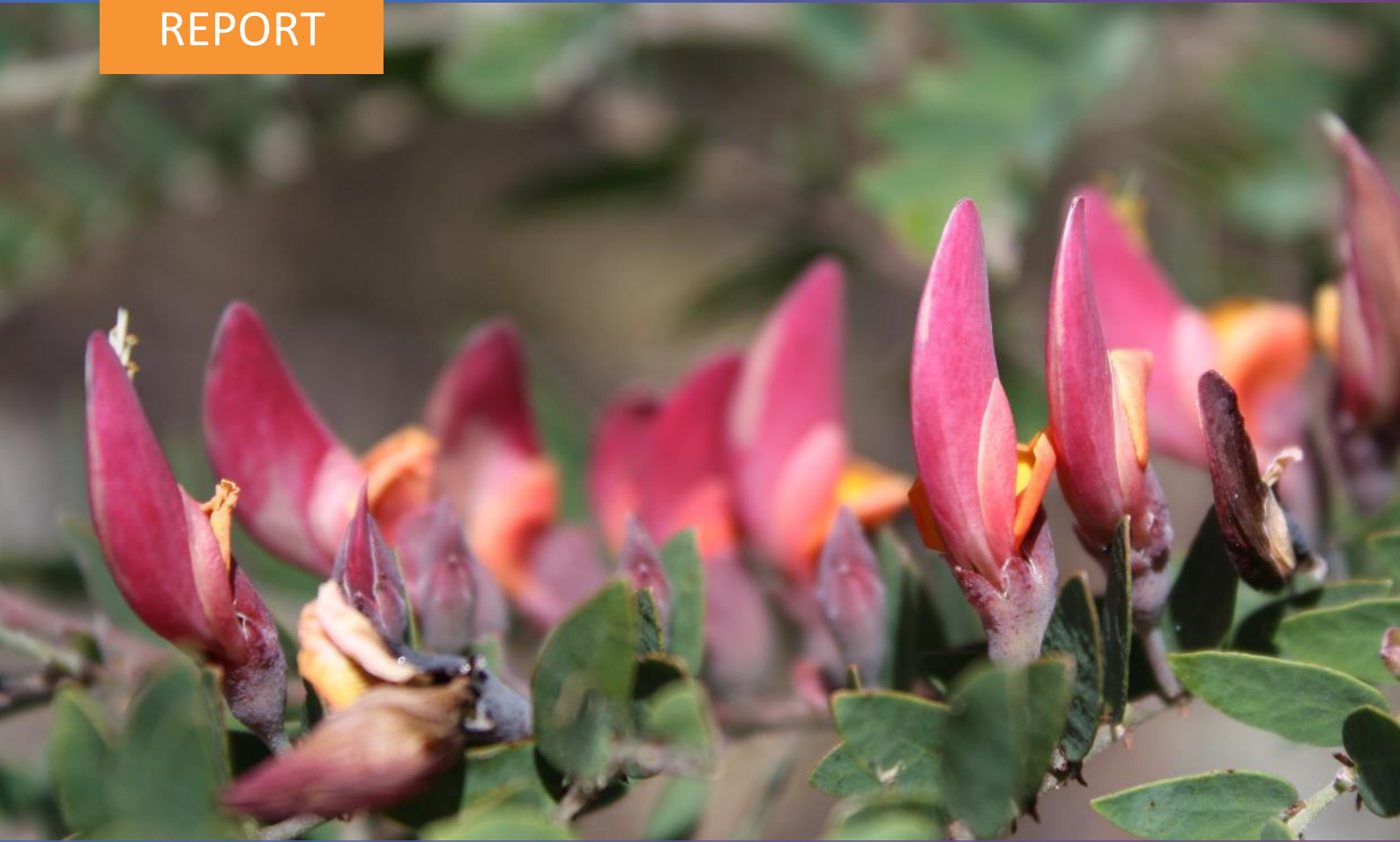


REPORT



# Supporting Information Document – Vulcan South MSES Offset Delivery Plan for Vitrinite Pty Ltd

09/01/2025



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## Executive Summary

METServe, a subsidiary of MEC Mining was engaged by Vitrinite Pty. Ltd., owner of Qld Coal Aust No.1 Pty. Ltd. and Queensland Coking Coal Pty. Ltd. (Vitrinite) to manage the environmental approval process for Vulcan South (the Project). The Project targets hard coking coal which has been identified through previous exploration activities and is located north of Dysart and approximately 45 km south of Moranbah in Queensland's Bowen Basin on ML700073

The Project will result in potential impacts to three Matters of State Environmental Significance (MSES) (that are not also Matters of National Environmental Significance (MNES)), namely:

- 36.3 ha of Glossy Black Cockatoo habitat;
- 3.3 ha of Of Concern Regional Ecosystem (RE) 11.3.2; and
- 20.5 ha of Vegetation Management Watercourse Regional Ecosystems (11.3.25, 11.5.9, 11.5.9b, 11.10.1, 11.10.3 and 11.10.7).

To counter these ecological impacts to MSES, Vitrinite proposes to deliver offsets that directly benefit each affected protected matter. A candidate offset location has been identified and assessed on Lot 3 of Plan SP314273, within three km south of the Impact area. This report supports the Offset Delivery Plan and assesses whether the offset site meets the requirements of the Environmental Offsets Act 2014 (QLD) and the Queensland Environmental Offsets Policy [EPP/2015/1658] and has the potential to achieve conservation gains.

Vitrinite has received the Proposed Federal Approval decision and conditions for the Vulcan South Coal Mine (EPBC 2023/09708), inclusive of approval of the federal Offset Area Management Plan (OAMP) in which this same offset area provides offsets for a number of MNES that are also MSES. The MSES that are addressed by the federal OAMP are not considered in detail in this assessment as offsets for these matters are delivered under the EPBC Act as is specified in the Vulcan South Environmental Authority.

Habitat quality assessments were undertaken at the candidate offset site in July 2024. The methodology used for the assessments are described in the BioCondition Assessment Manual Version 2.2 (2015) and closely followed the Queensland Guide to Determining Terrestrial Habitat Quality version 1.3. The field survey confirmed the presence of Poplar Box woodland on alluvial plains (RE 11.3.2) and Vegetation management watercourse REs, as well as the presence of *C. Cristata* species to support the Glossy Black Cockatoo and areas suitable for the plantation of habitat species for this matter.

Field-based assessments between June and August 2023 revealed that the habitat quality at the impact site was 66.1/100, 67.89/100 and 42.5/100 for the RE 11.3.2, vegetation management watercourse REs and Glossy Black Cockatoo habitat respectively.

The July 2024 field-based habitat quality assessment scores at the candidate offset site were 53.1/100, 59.90/100 and 34.1/100 for the RE 11.3.2, vegetation management watercourse REs and Glossy Black Cockatoo habitat.

An examination of each component of habitat quality for each species was undertaken to determine the potential for improving habitat quality within the offset site through management. This revealed that, for all matters, habitat quality is likely to improve by at least 2/10 over a 20-year management period. This can be achieved through implementing a weed and pest animal control program, along with judicious thinning of the shrub and midstory layer where in excess, which also manages fire and to create a more natural vegetation structure and improve the growth rates of retained trees. The management of cattle grazing will increase native recruitment with targeted grazing proposed to manage Buffel grass.

Considering the habitat quality at the impact and offset sites, the projected gains in habitat quality at the offset site, the averted risk of loss, and the confidence in these estimates, the candidate offset site generously compensates for the impacts of the Vulcan South Coal Mine for all MSES matters. The offset, the subject of this delivery plan, will achieve a conservation outcome for the impacted matters by achieving a 2-point condition gain in habitat quality score over 70% of the offset property in 20 years. This will be achieved by managing the identified threatening processes, with specific focus on replanting, as well as fire management, and weed and pest eradication.

## Part A Supporting information for Offset Delivery Plan

### 1 Introduction

Vulcan South is an open-cut and highwall coal-mining operation proposed by Vitrinite Pty Ltd (Vitrinite) between Dysart and Moranbah, in the Bowen Basin of Queensland. It is located on lots 2SP296877, 59SP235297, 72SP137467, 26CNS125 and 2CNS109, and within mining lease ML700073. The Environmental Authority (EA) for the Vulcan South Project (the “Project”) has outlined the needs to offset Matters of State Environmental Significance (MSES) which were determined to be significantly impacted by the project.

Offsettable matters that are not addressed by federal offsets are outlined in Section 3, Table 2-1 and include:

- 36.3 ha of Glossy Black Cockatoo habitat;
- 3.3 ha of Of Concern Regional Ecosystem (RE) 11.3.2; and
- 20.5 ha of Vegetation Management Watercourse Regional Ecosystems (11.3.25, 11.5.9, 11.5.9b, 11.10.1, 11.10.3 and 11.10.7).

This document serves to inform the Vulcan South Offset Delivery Plan and address the requirements of the Environmental Authority, Environmental Offsets Act 2014 (QLD) and the Queensland Environmental Offsets Policy [EPP/2015/1658] to offset significant residual impacts to Matters of State Environmental significance (MSES). As Matters of National Environmental Significance (MNES) will be offset under the *EPBC Act 1999* federal approval conditions (of which a proposed federal Approval decision has been made for 2023/09708), this document will focus solely on MSES not yet addressed through the EPBC Act process. The matters that will be offset under the EPBC Act and therefore not discussed within this report are the Koala (*Phascolarctos cinereus*) (endangered under EPBC Act), Squatter Pigeon (*Geophaps scripta scripta*) (vulnerable under EPBC Act), Greater Glider (*Petauroides volans*) (endangered under EPBC Act), and Brigalow (*Acacia harpophylla* dominant and co-dominant) (endangered under EPBC Act).

Offsets must achieve specific outcomes for prescribed matters. The offsets for each matter are measured against the required conservation outcomes in **Section 4**.

To achieve the required conservation outcomes and offset the impacts to MSES described above, Vitrinite proposes to protect and restore areas of land that support MSES impacted by the Project. This document addresses the obligations under the *Queensland Environmental Offsets Act (2014)* and *Environmental Offsets Policy (2014)* and how offsets are to be implemented.

To demonstrate the achievement of a conservation outcome using the habitat quality assessment method, the offset must meet the following two criteria: 1. After 20 years, the offset matter area habitat quality score must be at least 1 point greater than the impact matter area habitat quality score (prior to the impact); and 2. After 20 years, the offset matter area habitat quality score must have achieved an overall habitat quality gain of at least 2 points. The ODP offset delivery plan describes the management actions that will be implemented at the offset site to achieve the required improvement in habitat quality score. The most appropriate management actions for an offset will differ depending on the prescribed environmental matter and the landscape context but may be informed by the lowest-scoring site-based attributes at the offset matter area as these attributes will have the greatest potential for improvement with management.

The purpose of the Offset Delivery Plan is to describe how an offset will be undertaken and how the conservation outcome will be achieved, including how the plan will:

- effectively account for and manage the risks of the offset failing to achieve the conservation outcome;
  - ensure the offset provides benefits in relation to the prescribed environmental matter in addition to any other benefit provided under a requirement of, or an authority under an Act;
  - have transparent governance arrangements, including being able to be readily measured, monitored, audited, and enforced; and
  - ensure the offset is of a size and scale proportionate to the significant residual impacts on the prescribed environmental matter;

- state that the proponent, and any other entity that owns land on which the offset will be undertaken, agrees to the offset being undertaken;
- be signed by the proponent, and any other entity that owns land on which the offset will be undertaken;
- describe the prescribed environmental matter to which the offset condition relates;
- state whether the offset condition will be delivered wholly or partly on the land on which the offset will be undertaken;
- include particulars of, or a description sufficient to identify, the land on which the offset will be undertaken;
- identify and contain details of any person with an interest in the land on which the offset will be undertaken;
- describe the existing land use of the land on which the offset will be undertaken and any impact that land use may have on the delivery of the offset;
- state:
  - the measures the proponent will take to secure the land on which the offset will be undertaken as a legally secured offset area;
  - why the proponent considers the stated measures are reasonable and practicable;
  - the period during which the measures will occur; and
  - why the stated period is reasonable for the purpose of securing the offset.



## 2 Matters to be offset

The EA provided a table of MSES matters to be offset, reproduced below as **Table 2-1** and provided within **Appendix D**.

**Table 2-1: MSES Offsettable Matters as per the Approved Vulcan south EA**

Prescribed Environmental Matters	Delineation of habitat usage or quality (where relevant)	Maximum extent of impact (ha)	Location	State offset required?
Regional Ecosystem 11.3.2 Of Concern		3.3	Figure H6 (as per EA)	Yes
<i>Vegetation Management Watercourse REs</i>				
11.3.25		20.5	Figure H7 (as per EA)	Yes
11.5.9				
11.5.9b				
11.10.1				
11.10.3				
11.10.7				
<i>Threatened, Vulnerable and Special Least Concern Fauna Species listed under the Nature Conservation Act 1992</i>				
Habitat for an animal that is vulnerable -Glossy Black Cockatoo ( <i>Calyptorhynchus lathamii</i> )	NA	36.3	Figure H5 (as per EA)	Yes

Matters of State Environmental Significance to be offset and their requirements to demonstrate a conservation outcome, are described in the following sections:

- Glossy Black Cockatoo Habitat – **Section 8.1.1**
- Regional Ecosystem 11.3.2 – **Section 8.1.2**
- Vegetation Management Watercourse REs – **Section 8.1.3**

As Matters of National Environmental Significance (MNES) will be offset under the *EPBC Act 1999* federal approval conditions, this document focuses solely on MSES not yet addressed through the EPBC Act process. The matters that will be offset under the EPBC Act and therefore not discussed within this report are the Koala (*Phascolarctos cinereus*) (endangered under EPBC Act), Squatter Pigeon (*Geophaps scripta scripta*) (vulnerable under EPBC Act), Greater Glider (*Petauroides volans*) (endangered under EPBC Act), and Brigalow (*Acacia harpophylla* dominant and co-dominant) (endangered under EPBC Act).



### 3 Offset site selection

The proposed offset location is a subset of the property ‘Tay-Glen’, 10,832 ha within Lot 3 on SP314273. 8,283.25 ha of Tay-Glen has been selected as the offset area for the Project (refer to **Figure 3-1**). The offset site location is located within the Bowen Basin subregion of the Brigalow Belt Bioregion, adjacent to the town of Dysart, Queensland, and is located approximately 6 km southwest of the impact location (the Project). The offset site was selected for the following reasons:

- The proximity to the impact site;
- The proximity to state and regional biodiversity corridors
- The same bioregion as the impact site, and
- Field verified biodiversity values (**Section 3.7**).

#### 3.1 Existing land use

The predominant use of the offset property is cattle grazing with a small amount of cropping. Within the eastern and central portion of the property there are large areas of remnant vegetation and areas of High value Regrowth (HVR). The survival of this vegetation is presumably due to the difficult terrain and low fertility of the soils. Two waterways dissect the north (Philips Creek), and south (Stephens Creek), of the property from west to east. The waterways form a degraded connectivity corridor.

The site’s assessment unit (AU) 14 (RE 11.10.8) - Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks) has no benchmarks described by the Queensland Herbarium (2023) BioCondition Benchmark Database. In this case, the benchmark used for the offset site was 11.9.4a - Semi evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks), considered to be a RE of similarities for RE 11.10.8. The field-verified mapping found 43 distinct vegetation units contained within the offset area.

All REs within the offset property could be classified as Category B, Category C or Category X. In areas where the vegetation is mapped as remnant, there was evidence of extensive historic clearing, timber harvesting, thinning and grazing.

Non-remnant areas varied from open paddocks of agricultural feed to containing extensive regrowth shown by the presence of saplings and seedlings. A number of these areas also appeared to have been chemically treated, indicating while the area may contain minimal current vegetation, significant soil seed source is still present. Areas of high value regrowth seemed to have experienced significant disturbance including aerial herbicide spraying. Without spraying the natural progression of plant communities suggest that in certain sections natural regeneration without the need for planting is likely. Therefore, the existing land use is not anticipated to have any effect on offset delivery.

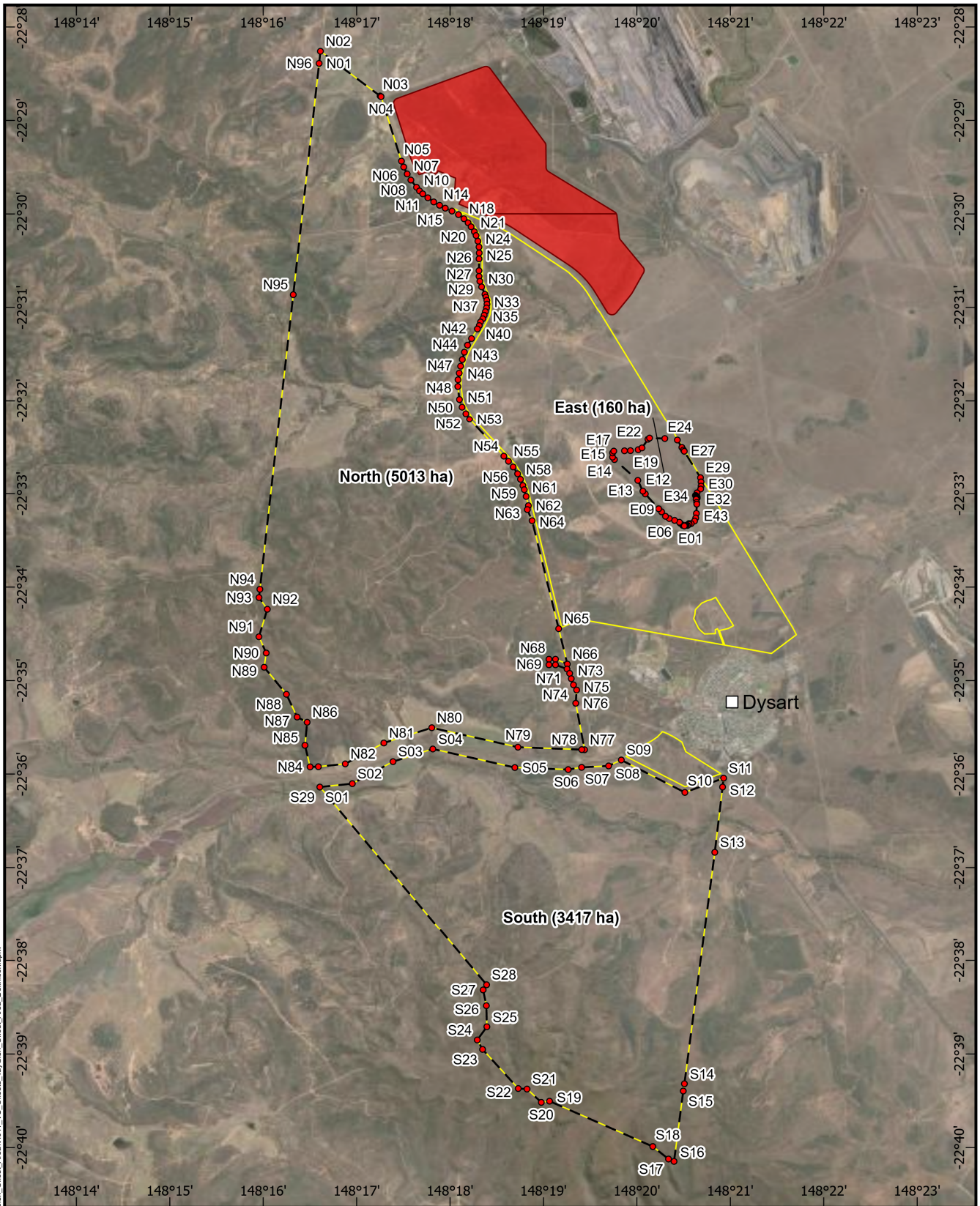
#### 3.2 Connectivity

Within the eastern and central portion of the property there are large areas of remnant vegetation and areas of High-value Regrowth (HVR). The retention of these vegetated areas is presumably due to the difficult (steep) terrain and low fertility of the soils. Two waterways dissect the north (Philips Creek), and south (Stephens Creek), of the property from west to east. The waterways form a degraded connectivity corridor.

Riparian corridors classed as regional and state corridors under QLD waterway mapping dissect the offset area along these two waterways.

The offset area is within 2.5km of a biodiversity corridor of state significance, located to the south and west the connects the Carborough and Cherwell Ranges, and the Dawson and Boomer Ranges.

The proximity of ecological corridors to the offset site is displayed in **Table 3-1**.



Path: S:\Projects\W011\_VCP\_Stage2\ArcGIS\ProjectFiles\Projects\Tay\_Glen\_Offset\_Area\W011\_VS\_Offset\_Area\Definition.aprx

**Legend**

- Town
- Offset Area Vertices
- Offset Area
- Property Boundary
- Protected Areas (none nearby)
- Category A Regulated Vegetation

Source: State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development 2024; Department of Environment and Science 2024), Biodiversity Australia 2024, METServe 2024, Vitrinite 2024, Earthstar Geographics.

<h2 style="margin: 0;">Vulcan South</h2> <h3 style="margin: 0;">Offset Site Location</h3>	
<p><b>Kilometers</b></p> <p>Scale: 1:110,000 (A4)</p>	<p style="text-align: center;">11/12/2024</p> <p style="text-align: center;">Datum: GDA2020 Projection: GCS GDA2020</p> <p style="text-align: center;"><b>FIGURE 3-1</b></p>



### 3.3 Proximity to ecological corridors

Two waterways dissect the north (Philips Creek), and south (Stephens Creek), of the property from west to east. The waterways form a degraded connectivity corridor. Riparian corridors classed as regional and state corridors under QLD waterway mapping dissect the offset area along these two waterways.

The offset area is within 2.5km of a biodiversity corridor of state significance, located to the south and west the connects the Carborough and Cherwell Ranges, and the Dawson and Boomer Ranges. Refer to **Figure 3-2** above.

### 3.4 Existing Protection

The existing level of protection is an important consideration for potential offset areas. An offset has maximum benefit if it delivers a high level of protection to areas that otherwise had a high risk of loss. Offsets are only suitable for areas of land that are not fully protected from clearing by other laws or legal instruments. By securing Tay-Glen as an offset site, a higher level of protection of ecological values will be achieved.

Vegetation in Queensland is protected on various levels under the *Vegetation Management Act 1999* (VM Act), summarised as follows:

- Category A: Compliance areas. Environmental offset areas, declared areas;
- Category B: Remnant vegetation;
- Category C: High value regrowth;
- Category R: Areas within 50 m of a watercourse or drainage within all Great Barrier Reef catchments; and
- Category X: Exempt.

Despite the fact that remnant vegetation is protected in Queensland as category B, a small amount of clearing occurs annually through exempt works and illegal activities. In a cattle grazing property such as Tay-Glen, such exempt works include clearing for fodder harvesting, ensuring public safety, building a residence, reducing hazardous fuel loads, harvesting timber to repair infrastructure, managing thickened vegetation, and establishing fences, tracks and firebreaks.

Additionally, grazing within these habitats, if not managed appropriately, will cause significant loss of biodiversity and ecological functions of these mapped areas. While the vegetation will not be “cleared”, the ecological function of the community can be “lost”.

### 3.5 Landscape

The offset site contains topography ranging from 450 m above sea level to 190 m above sea level. Land zones within the offset property including:

- land zone 3: Cainozoic alluvial plains and piedmont fans,
- land zone 4: Cainozoic clay deposits, gently undulating plains,
- land zone 5: Cainozoic sand deposits, extensive flat or gently undulating plains,
- land zone 8: Cainozoic igneous rocks, flooded basalts forming extensive plains and occasional low scarps, and
- land zone 10: Cainozoic/Proterozoic consolidated medium to coarse grained sediments.

The site contains several dams, water tanks and ephemeral to permanent waterways providing viable permanent water sources for native fauna. The offset property contains several first and second order streams including:

- Downs Creek to the east of the offset property and
- Stephens Creek within the southern section of the of the offset property.

Stephens Creek contained water and while it is unlikely to be a permanent source of water, it is expected to contain water for extended periods.

The Queensland Government’s Guide to Determining Terrestrial Habitat Quality version 1.3 specifies that the landscape-scale components of BioCondition are not considered as part of habitat quality for offsets. They are nevertheless to be reported, as position in the landscape must be appropriate for delivering an offset that achieves a conservation outcome. A “moderate” landscape score is necessary for an offset to be suitable, although the minimum acceptable landscape-scale attribute score is “determined by the administering agency on a case-by-case basis”.

The subregion in which the offset site is located within is considered fragmented.

The offset site had a landscape score of 16/20, which is slightly higher than the impact site’s score of 14/20 (Table 3-1). The high landscape score of the offset site is likely to be suitable for delivering offset gains for the MSES.

**Table 3-1 Landscape-scale BioCondition scores**

Landscape Attribute	Impact Site	Offset area
<b>Size of patch</b>	10/10	10/10
<b>Connectivity</b>	0/5	2/5
<b>Context</b>	4/5	4/5
<b>Total score</b>	14/20	16/20



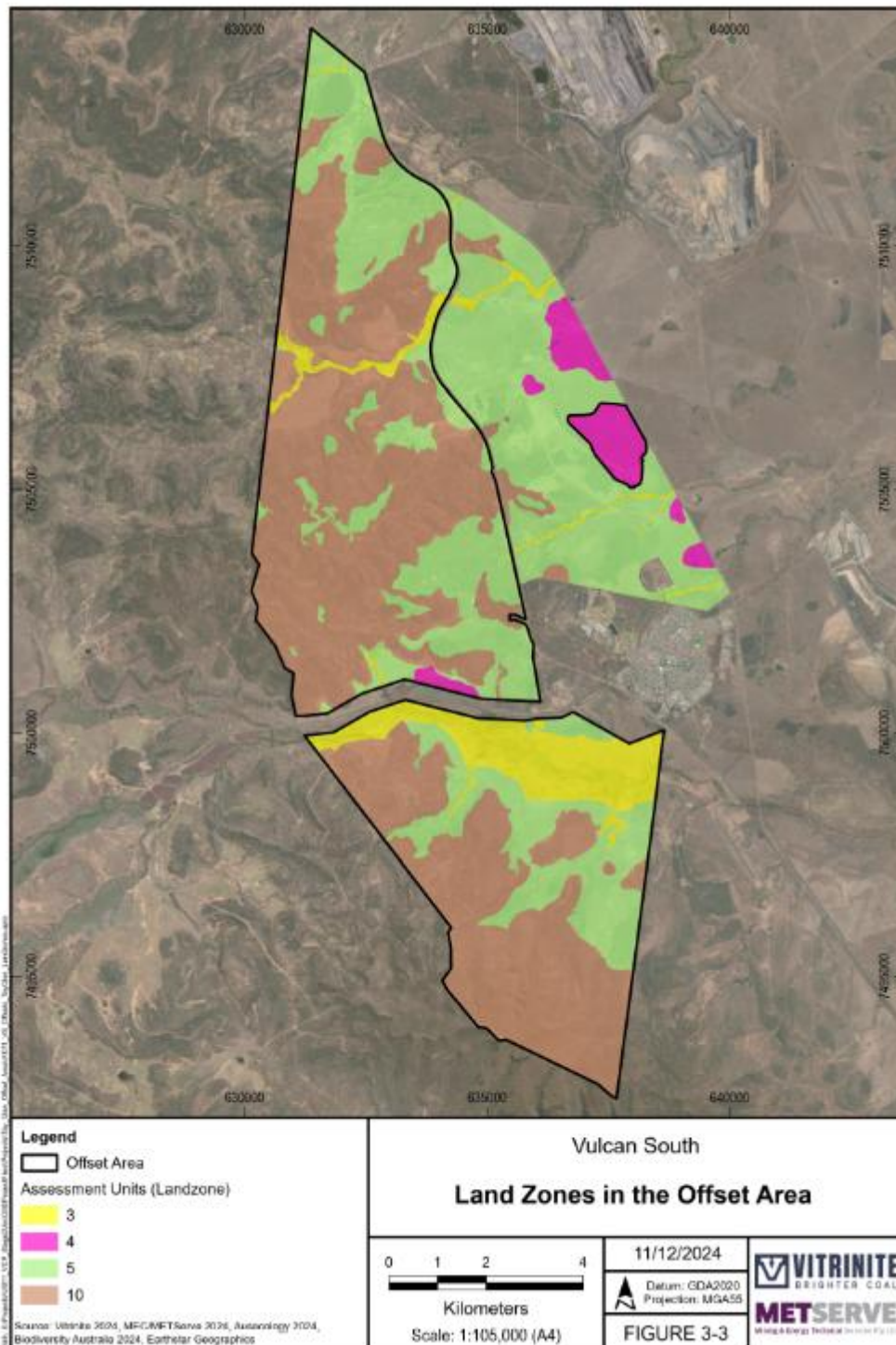


Figure 3-3 Land zones in offset area

### 3.6 Vegetation

The regional ecosystem map published by the Queensland Herbarium shows multiple vegetation units within the offset site. The boundaries of these units were refined based on satellite imagery, and their identities were ground-truthed during field surveys. These field surveys revealed that the published mapping was largely correct.

Benchmarks are specific to each regional ecosystem (RE) or vegetation community in Queensland. However, benchmarks for a number of REs are not developed or provided on the Regional Ecosystem Description Database (REDD) maintained by the Queensland Herbarium, Department of Environment, Tourism, Science and Innovation (DETSI.) BioCondition Benchmark Database. Version 3.4 (April 2023).

The sites assessment unit AU 14 (RE 11.10.8 - Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks) has no benchmarks described by the Queensland Herbarium (2023) BioCondition Benchmark Database. In this case, the benchmark used for the offset site was 11.9.4a - Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks), considered to be a RE of similarities for RE 11.10.8.

The field-verified mapping found 43 distinct vegetation units contained within the offset area.

All REs within the offset property could be classified as Category B, Category C or Category X (Table 3-2). In areas where the vegetation is mapped as remnant, there was evidence of extensive historic clearing, timber harvesting, thinning and grazing.

Non-remnant areas varied from open paddocks of agricultural feed to containing extensive regrowth shown by the presence of saplings and seedlings. A number of these areas also appeared to have been chemically treated, indicating while the area may contain minimal current vegetation, significant soil seed source is still present. Areas of high value regrowth seemed to have experienced significant disturbance including aerial herbicide spraying. Without spraying the natural progression of plant communities suggest that in certain sections natural regeneration without the need for planting is likely.

**Table 3-2 Vegetation Units Within the Offset Area**

Assessment unit	Regional ecosystem	Descriptions	VM Act category	Area (ha)
AU01	11.10.1	<i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks	B	57.37
AU02	11.10.12	<i>Eucalyptus populnea</i> woodland on medium to coarse-grained sedimentary rocks	X	77.91
AU03	11.10.12	<i>Eucalyptus populnea</i> woodland on medium to coarse-grained sedimentary rocks	C	3.08
AU04	11.10.1x1	Variation of <i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks. This variation includes <i>Eucalyptus crebra</i> , <i>Corymbia clarksoniana</i> , <i>Eucalyptus melanophloia</i> and <i>Acacia burdekenensis</i> in varying proportions in the emergent and/or canopy layers.	X	31.29
AU06	11.10.1x1	Variation of <i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks. This variation includes <i>Eucalyptus crebra</i> , <i>Corymbia clarksoniana</i> , <i>Eucalyptus melanophloia</i> and <i>Acacia burdekenensis</i> in varying proportions in the emergent and/or canopy layers.	B	2705.07
AU07	11.10.3	<i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	X	46.89
AU08	11.10.3	<i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	C	28.51
AU09	11.10.3	<i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps.	B	1229.72
AU10	11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	X	259.65



Assessment unit	Regional ecosystem	Descriptions	VM Act category	Area (ha)
AU11	11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	C	9.77
AU12	11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	B	567.59
AU13	Disturbed 11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	B	12.80
AU14	11.9.4a	Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary	B	33.38
AU15	11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	C	19.01
AU16	11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	B	28.10
AU17	11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains.	X	212.56
AU18	11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains.	C	7.47
AU19	11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains.	B	92.03
AU20	Disturbed 11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains.	B	30.57
AU23	11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	B	205.13
AU24	Disturbed 11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	B	6.36
AU25	11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	X	47.44
AU26	11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	B	61.06
AU27	Disturbed 11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	B	15.33
AU29	11.3.39	<i>Eucalyptus melanophloia</i> +/- <i>E. chloroclada</i> open woodland on undulating plains and valleys with sandy soils	B	0.34
AU30	Disturbed 11.3.39	<i>Eucalyptus melanophloia</i> +/- <i>E. chloroclada</i> open woodland on undulating plains and valleys with sandy soils	B	0.30
AU31	11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	X	185.64
AU32	11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	B	8.55
AU33	Disturbed 11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	B	401.22
AU34	11.5.3	<i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	X	9.98

Assessment unit	Regional ecosystem	Descriptions	VM Act category	Area (ha)
AU35	11.5.3	<i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	C	22.76
AU36	11.5.3	<i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	B	0.68
AU38	11.5.9b	<i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges.	X	785.52
AU39	11.5.9b	<i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges.	C	31.52
AU40	11.5.9b	<i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges.	B	1081.93
AU41	Disturbed 11.5.9b	<i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges.	B	13.10
AU42	11.5.12a	<i>Corymbia clarksoniana</i> woodland and other <i>Corymbia</i> spp. and <i>Eucalyptus</i> spp. on Cainozoic sand plains and/or remnant surfaces	B	110.17
AU43	Disturbed 11.10.12	<i>Eucalyptus populnea</i> woodland on medium to coarse-grained sedimentary rocks	B	2.75

### 3.7 Presence/utilisation of matters of interest on Offset site

Surveys within the offset areas were conducted in July 2024. The survey results and assessments of suitable habitats for the MSES matters are presented in Part B along with an assessment of likelihood that the offset area supports the three MSES. **Section 17** describes the field methodology in assessing the presence or utilisation of the matters of interest.

The assessment is summarised below in **Table 3-3**.

**Table 3-3 Presence of Matters of Interest**

Matter	Likelihood of Presence	Evidence
RE 11.3.2	Known to occur	REs associated with Poplar Box (RE 11.3.2) were directly observed in the July 2024 survey
Vegetation management watercourse REs	Known to occur	Remnant (category B REs) were ground-truthed within the offset area and subsequently mapped
Glossy Black Cockatoo	Potential	Suitable foraging habitat were observed on site in small patches.

### 3.7.1 Regional Ecosystem 11.3.2

Regional Ecosystem 11.3.2 or 'Poplar Box Grassy Woodland on Alluvial plains' (as it is labelled under the *EPBC Act 1999*), is listed as Of Concern under the *Vegetation Management Act 1999*. This Regional ecosystem does not meet the criteria of a TEC and therefore does not require offsetting under the *EPBC Act 1999* and will only be offset under the *QLD Offsets Act 2014* as a Of Concern RE.

Poplar Box Grassy Woodland on Alluvial Plains (RE 11.3.2) is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. The ecological community mostly occurs in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origin (Webb, Gunn, & Mortlock, 1980). This RE occurs on Cainozoic alluvial plains with variable soil types including texture contrast, deep uniform clays, massive earths and sometimes cracking clays. Occasionally, *E. melanophloia* or *E. crebra* may be present within this RE. A secondary tree layer may occur and can include species such as *Geijera parviflora*, *Eremophila mitchellii*, *Acacia salicina*, *Cassia brewsteri*, and *Acacia excelsa*. The ground layer is dominated by a range of tussock grasses, including *Chloris* spp., *Enteropogon* spp., and *Aristida* spp (DCCEEW, 2024).

A total of 3.3 ha of RE 11.3.2 is required to be offset under the EA.. Although this RE is partly located within the defined distance of a watercourse (and therefore technically falls under the category of 'Vegetation Management watercourse REs), it is defined by its highest status (Of Concern) which takes present in its classification. Therefore, it is treated in its entirety in the EA as an Of Concern RE.

The habitat quality for this RE was assessed using the BioCondition methodology (Neldner, et al., 2020). The matter area for this RE within the offset site is shown in **Figure 3-4**.

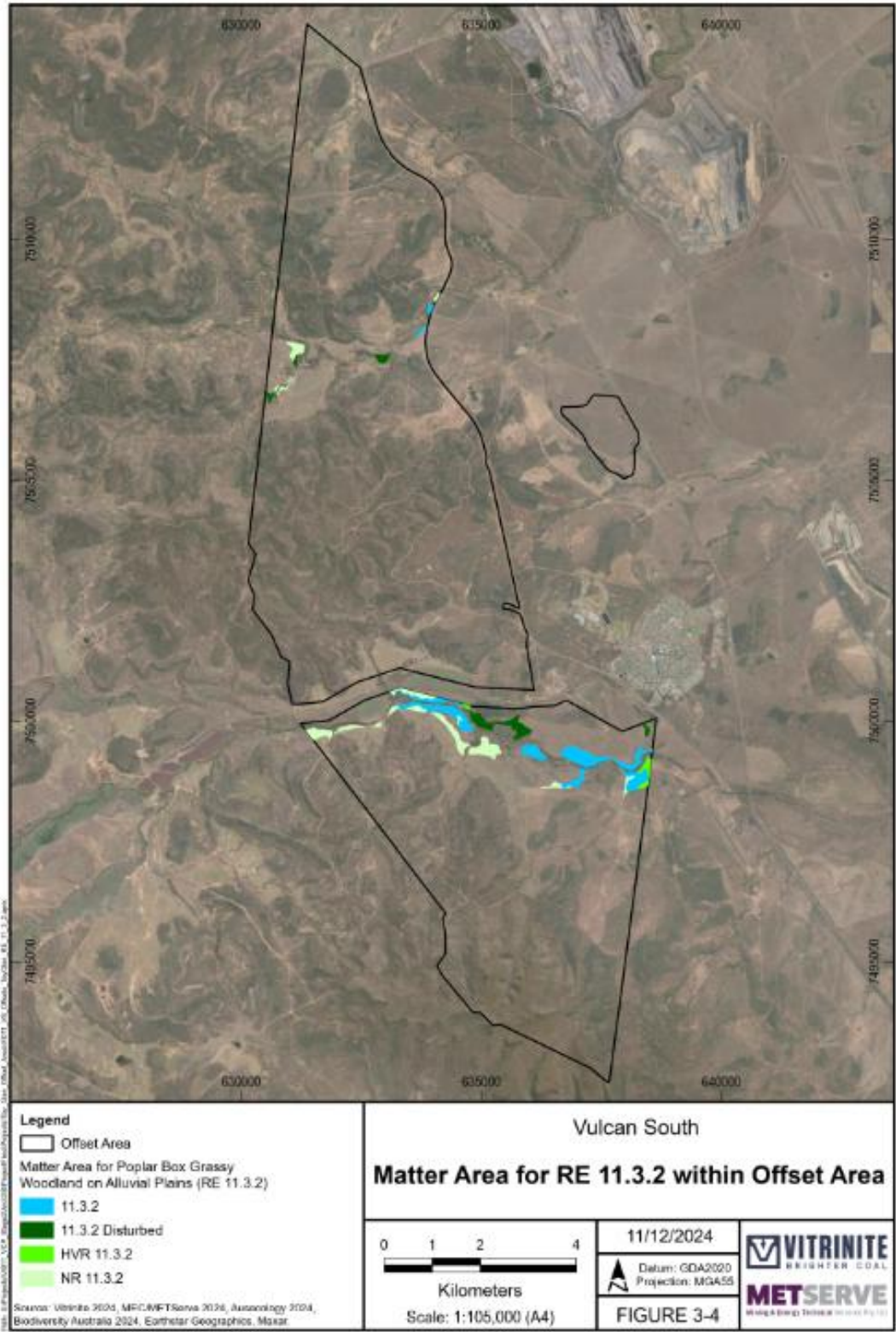


Figure 3-4 Matter area for RE 11.3.2 within offset area

### 3.7.1.1 Threatening processes on offset site

The following section discusses the key threatened processes which may create a risk to capacity of the offset area to protect the MSES matters of interest.

'Threatening Processes' is defined under s.12 of the *Nature Conservation Act 1992* as:

A threatening process is any process that is capable of—

- threatening the survival of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat; or
- affecting the capacity of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat to sustain natural processes.

The key threatening processes to RE 11.3.2 (as described in the EPBC Act 1999 conservation advice) relevant to the offset site include land clearance, weed invasion, land degradation by feral pests and inappropriate fire regimes (DCCEEW, 2024). These threatening processes are discussed in more detail below.

Land clearance for this RE is primarily associated with agricultural practices and is an inherent risk within unprotected land in QLD.

Weeds compete with locally indigenous flora species for available resources (water, light, nutrients) and lead to a decline in the diversity and regenerative capacity of native vegetation (DCCEEW, 2024)

The Poplar Box Grassy Woodland (present within the offset site as RE 11.3.2) provides habitat for many ground dwelling birds and animals. Pest species such as foxes and cats impact these small to medium native animal species through predation and also compete for resources. Rabbits can selectively remove the most palatable herbs and grasses and suppress regeneration. Goats damage trees and can cause erosion, while pigs damage ground layer vegetation by digging and turning over soil thus impacting on the structure and integrity of the ecological community (DCCEEW, 2024)

Fire intensity, frequency, seasonality and patchiness in addition to grazing by domestic stock and pest animals, influence vegetation composition and structure as well as the success of weeds. More intense and frequent fires, as a result of introduced grasses for grazing, can substantially reduce the understorey diversity and further their spread into the ecological community.

The use of the property for offsets will cease the potential for habitat clearing and offset site management measures (see **Section 8.3**) will appropriately manage the risk of erosion. The risk of weeds, invasive species and susceptibility off fire will be managed as per the management actions described in **Section 4** and **Section 8.3**

### 3.7.1.2 Requirements for RE offsets

In relation to endangered and of concern regional ecosystems—the offset site must be:

- of the same broad vegetation group as the impacted regional ecosystem; and
- of the same regional ecosystem class or higher regional ecosystem class under the Vegetation Management Act 1999; and
- within the same bioregion.

### 3.7.2 Vegetation Management Watercourse REs

Vegetation management watercourse REs are listed as Least Concern under the VM Act.

Regional Ecosystems that are mapped as remnant (category B) and within “the defined distance from the defining banks of a watercourse” are considered to be MSES, which require offsetting if clearing or disturbance meet *both* of the following self-test outcomes, taken from the Queensland Environmental Offsets Policy – Draft Significant Residual Offsets Guide (Queensland Government, 2014):

The following defines vegetation management watercourse REs:

- greater than 25m wide in a grassland (structural category) regional ecosystem; or

- greater than 20m wide in a sparse (structural category) regional ecosystem; or
- greater than 10m wide in a dense to mid-dense (structural category) regional ecosystem.
- For clearing other than clearing for linear infrastructure:
  - area greater than 5 ha where in a grassland (structural category) regional ecosystem; or
  - area greater than 2 ha where in a sparse (structural category) regional ecosystem; or
  - area greater than 0.5 ha where in a dense to mid-dense (structural category) regional ecosystem

For vegetation intersecting a watercourse or drainage feature the offset site must be:

- of the same broad vegetation group as the impacted regional ecosystem; and
- within the same bioregion; and
- associated with a watercourse or drainage feature.

The EA lists the following VM Watercourse REs in Table 3-4, including Broad Vegetation Group (BVG) within the impact area to be offset (**Table 3-4**). Calculations are included in **Appendix A**.



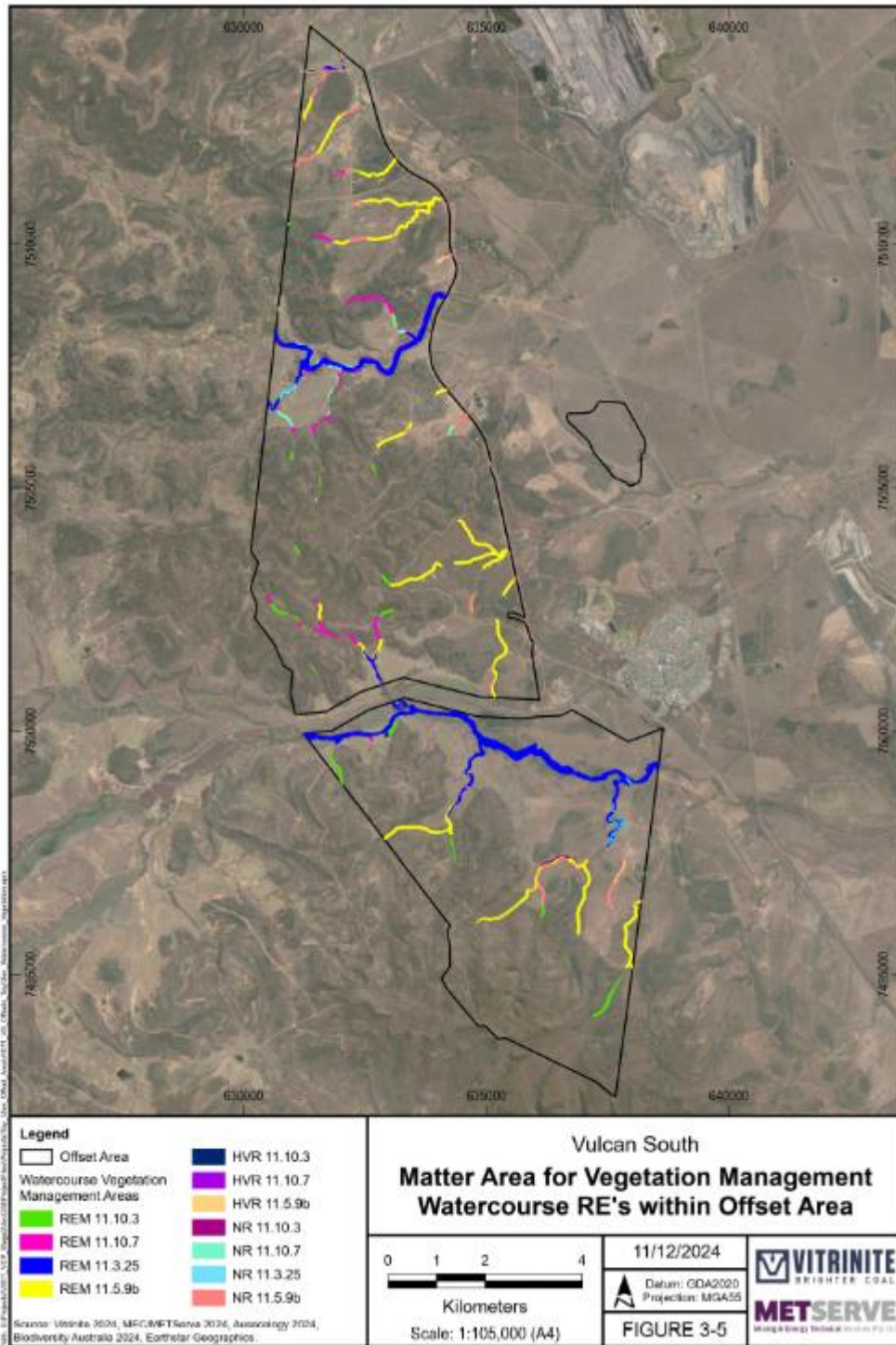


Figure 3-5 Matter Area for Vegetation Management Watercourse REs Within Offset Area



**Table 3-4: Impacted Vegetation Management Watercourse REs**

RE	Description	Area (ha)	BioCondition score in impact area	Weighted Average at impact site	BVG at 1M scale	BVG at 521M	Amount required in offsets as determined by calculator (ha)	Total hectares to be offset
11.3.2 <sup>2</sup>	<i>Eucalyptus populnea</i> woodland on alluvial plains	3.3	66.1	67.85	17a	05	9.9	64.51 (including 41.17 in watercourse areas)
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	1.44	58.30		16a	04_16	5.76	175.16
11.5.9	<i>Eucalyptus crebra</i> and other <i>Eucalyptus spp.</i> and <i>Corymbia spp.</i> woodland on Cainozoic sand plains and/or remnant surfaces	0.74	62.50 <sup>1</sup>		18b	05	41.06	152.54
11.5.9b	11.5.9b: <i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia spp.</i> woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges. Soils are generally deep red earths. Not a Wetland. (BVG1M: 18b).	9.51						
11.10.1	<i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks	2.42	51.80		10a	03_09_10	9.68	39.66 <sup>3</sup>
11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	0.04	61.70		12a	03	0.16	
11.10.3	<i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	3.44	73.40		24a	10_24	13.76	26.55
<b>TOTALS</b>		<b>20.5</b>				<b>70.42</b>	<b>381.16</b>	
<sup>1</sup> BioCondition benchmarks did not exist for 11.5.9b, so 11.5.9 was used and these REs were grouped as they share a BVG type <sup>2</sup> RE 11.3.2 was missing from the VM watercourse RE list for offsetting in the EA but was included in the total. This RE is included in the offset management area <sup>3</sup> 11.10.1 and 11.10.7 are able to be combined as they are very similar floristically and geologically								

### 3.7.2.1 Threatening processes on offset site

The key threatening process for this group of Regional Ecosystems is the risk of clearing or fragmentation. Other threatening processes include weed invasion, land degradation by feral pests, erosion and inappropriate fire regimes, or bushfire.

Land clearance for this RE is primarily associated with agricultural practices and is an inherent risk within unprotected land in QLD.

Weeds compete with locally indigenous flora species for available resources (water, light, nutrients) and lead to a decline in the diversity and regenerative capacity of native vegetation.

The use of the property for offsets will cease the potential for habitat clearing and offset site management measures (see Section 8.3) will appropriately manage the risk of erosion. The risk of weeds, invasive species and susceptibility off fire will be managed as per the management actions described in **Section 4** and **Section 8.3**

### 3.7.3 Glossy Black Cockatoo

The Glossy Black Cockatoo is listed as Vulnerable under the NC Act. The Glossy Black-cockatoo (*Calyptorhynchus lathami*) is the smallest of the black cockatoos. It is known from southern and Eastern Australia with several subspecies being currently recognised (Denis A Saunders, 2023):

*C. l. lathami* (Southeastern Australia south of 26 degrees)

*C. l. erebus* (North of 26 degrees)

*C. l. halmaturinus* (Kangaroo Island)

Genetic and morphological analysis presents a strong case for consideration of all the differences as no more than clinal or regional variation, and that the species should not be subdivided into subspecies (Denis A Saunders, 2023).

Glossy Black Cockatoos specialise in feeding on the female cones of species of *Casuarina* and *Allocasuarina* trees, with certain species preferred over others. In total, nine species are relied upon. Of these, the following are considered to be locally important foraging species, ranked by importance as outlined in the Approved Conservation Advice for the southeastern population (DCCEEW, 2022):

- *Casuarina cristata*
- *Allocasuarina luehmannii*
- *Casuarina cunninghamii*

#### 3.7.3.1 Breeding and shelter habitat requirements

The Glossy Black-cockatoo has specific breeding requirements, opting for nest sites with the following important characteristics (DCCEEW, 2022):

- More than 8 m above ground;
- Located in branches >30 cm in diameter;
- Branch or stem no more than 45° from vertical; and
- Minimum entrance diameter of >15 cm

Furthermore, nesting sites, at least for the Kangaroo Island population are usually within 1 km of primary food trees and 200 m of permanent water, noting that breeding success has not been adversely affected when adults commute up to 14 km between nest and feeding sites (DCCEEW, 2022). Glossy Black Cockatoos specialise in feeding on the female cones of species of *Casuarina* and *Allocasuarina* trees, with certain species preferred over others. In total, nine species are relied upon. Of these,

the following are considered to be locally important foraging species, ranked by importance as outlined in the Approved Conservation Advice for the southeastern population (DCCEEW, 2022).

Qualifying breeding habitat will take into account the species of tree and the likelihood of the habitat supporting trees of a suitable size that are capable of supporting limbs large enough to form acceptable hollows. For the purposes of this assessment, trees with vertical hollows (such as stems with snapped-off crowns) will be considered as these meet the definition of “no more than 45° from vertical”.

Hollows may not be visible from the ground, even if present on a tree or stem due to the tendency for the species to choose hollows that are strongly angled upwards and therefore out of view from the ground. The habitat quality for breeding purposes is therefore determined by the probability that the assessment unit is capable of supporting trees large enough to contain suitable hollows based on their diameter at breast height (DBH), rather than hollow counts which do not account for suitable hollows. Cameron (2006) found that Glossy Black Cockatoo nest trees were typically large, with 80% of nesting trees assessed having a DBH of equal to or greater than 60 cm (mean = 70 cm, range = 39–96 cm). It is acknowledged that suitable hollows may be present but relatively rare in the landscape, and therefore be located outside BioCondition plots but still fall within the assessment unit.

The presence of suitable tree species as mentioned in the Approved Conservation Advice (DCCEEW, 2022) will be factored in. Such trees within the BRBN region are most likely to occur in areas with access to soil moisture year-round such as remnant habitats along watercourses. This is supported by the habitat preferences by species relevant to the region that are specifically mentioned in the conservation advice: *Eucalyptus crebra* and *Eucalyptus camaldulensis*. It should be assumed that *Eucalyptus tereticornis*, due to its similarity to *E. camaldulensis* would also be included as a likely candidate. Regional Ecosystems that lack any of these species are considered unlikely to support breeding habitat for the Glossy Black-cockatoo.

In a study of nesting hollows (Cameron, 2006) it was found that Glossy Black-cockatoos preferred to nest in the company of conspecifics, which was supported by the density of suitable hollows being a major factor in a site being used. Therefore, the number of potential hollows will serve as an index for the availability of suitable hollows. The chance of a nest being located within an area increased by a factor of 1.9 for each additional potential nest hollow per ha (Cameron, 2006). Cameron (2006) suggests that densities of 20-30 large trees (between 40-60cm DBH) per ha, are a suitable/ideal density to maximise potential nesting habitat for Glossy Black Cockatoo.

### 3.7.3.2 Presence on impact site

A small group of Glossy Black-cockatoos were observed feeding in *Casuarina cristata* trees within the Project’s impact area in 2019. The occurrence of Glossy Black-cockatoos within the Project area was unusual for several reasons:

- The survey area is far from the closest known permanent populations to the south and east, at Blackdown Tableland, the Clarke Range and the Rockhampton-Shoalwater Bay region.
- The survey area contains multiple small patches of feeding habitat (total of 74.5 ha in the survey area and 38.1 ha in the impact area) isolated from other feeding habitat by extensive tracts of cleared farmland, mines and forest lacking food trees. The small areas of habitat present are almost certainly insufficient to provide a year-round supply of seed. Glossy Black-cockatoos on Kangaroo Island generally require at least 400 ha of feeding habitat within 12 km of nests for successful breeding (Mooney & Pedler, 2005).
- The species was not recorded during the extensive fauna surveys undertaken on site, despite particular focus on habitats likely to support the species (i.e., Brigalow areas), due to the potential of this habitat to also harbour Ornamental Snakes and other threatened species.

Taken together, the above evidence suggests that the site provides foraging habitat used occasionally by transient individuals, rather than a locally resident breeding population. The Capricornia region was experiencing a severe rainfall deficit during the survey periods. Furthermore, large areas of Glossy Black cockatoo habitat at Shoalwater Bay experienced bushfires in 2021 (NAFI, 2022).

These environmental factors may have caused a food shortage within their more usual home ranges, encouraging dispersal to new, suboptimal locations. A similar pattern was observed in southeastern Queensland following the drought and fires of 2019 (Cornell lab of Orthinology, 2022).

The habitat scoring for the species indicated the habitat was low quality prior to disturbance for the Project (**Table 19-1**).

Therefore, the habitat within the impact site barely qualifies as foraging habitat and would likely only be used by transient individuals. Habitat within the impact area is not of a high enough quality to be used by a breeding population.

### **3.7.3.3 Presence on offset site**

Although, no Glossy Black-cockatoos were explicitly found during surveys of the offset site, the quality of foraging habitat is significantly higher than the impact area.

In relation to a plant or animal that is critically endangered, endangered, vulnerable, near threatened and special least concern wildlife under the Nature Conservation Act 1992—the offset site must contain, or be capable of containing, a self-sustaining population of that same impacted species. Given the impact area has little to no potential for supporting the species based on the paucity of sightings in the region, the offset site already has a greater capacity for supporting the species than the impact area. Stands of large trees along watercourses, access to permanent water and foraging opportunities are present but could be improved.

There is minimal Atlas of Living Australia records within a 50 km radius as shown in **Figure 3-6** below.

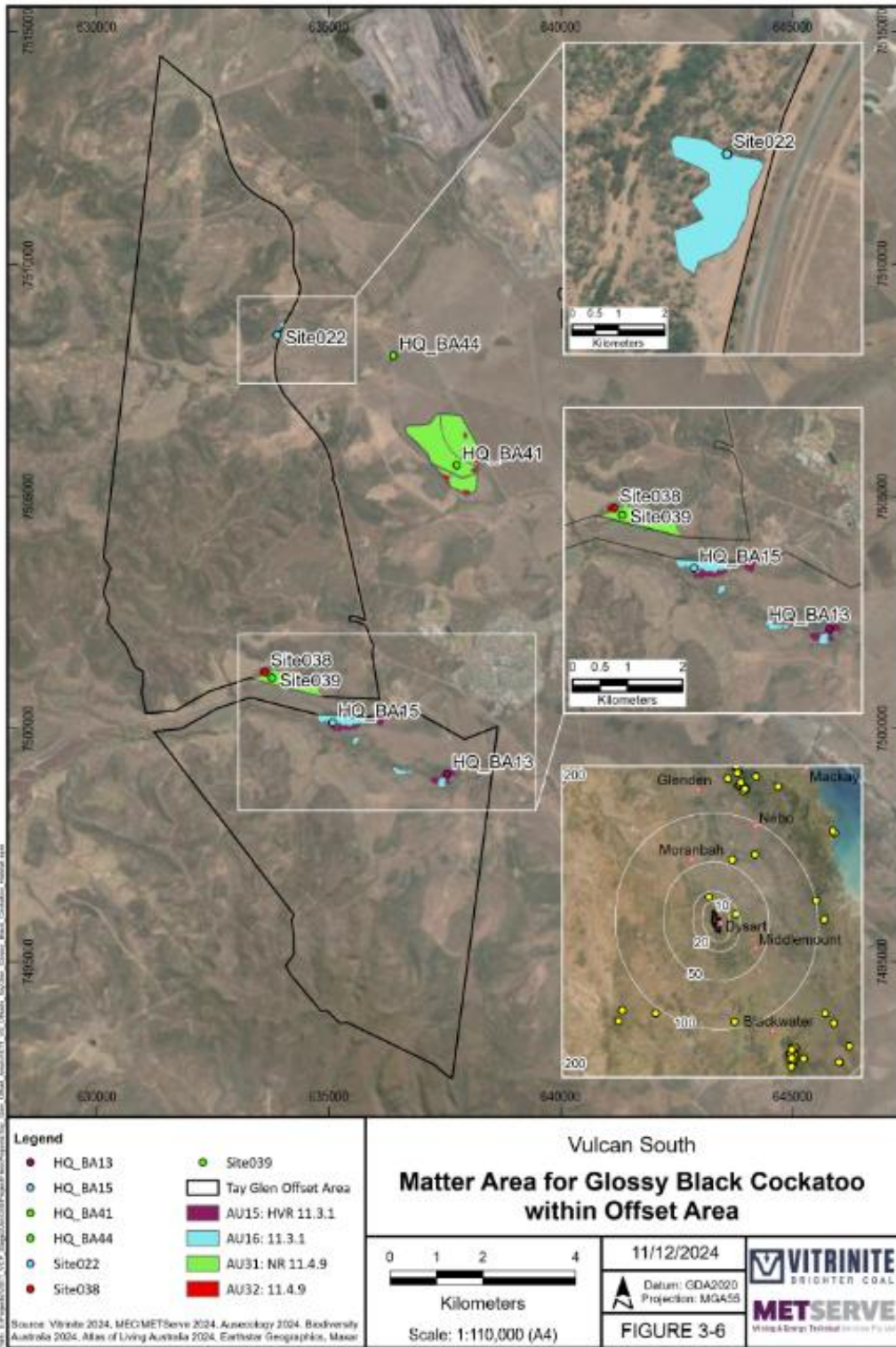


Figure 3-6 Matter area for the Glossy Black-cockatoo within offset area

### 3.7.3.4 Threatening processes at Offset site

Specific threats to the species are related to loss of habitat, particularly of nesting trees with suitable hollows (DCCEEW, Conservation Advice for *Calyptorhynchus lathami lathami* (South-eastern Glossy Black Cockatoo), 2022). The greatest cause of this threat is fire, particularly intense fires which burn through large areas, although areas which have not been burned (with lower intensity) for over 10 years also see a drop in habitat quality (DCCEEW, 2022). Brigalow ecological communities are not generally fire tolerant, therefore burning will not be considered as a management tool in these areas.

In addition to the above, the Approved Conservation Advice includes the following risk matrix of known and suspected threats to the species, reproduced in **Table 3-5**:

**Table 3-5: Risk matrix for the Glossy Black-cockatoo**

Likelihood	Consequence				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain	-	-	Habitat fragmentation	<ul style="list-style-type: none"> <li>Inappropriate fire regimes</li> <li>Increased likelihood of extreme events (i.e., heatwave and drought)</li> <li>Clearing of native vegetation/timber harvesting</li> </ul>	-
Likely	-	Predation	Competition for nest hollows	Temporal or spatial shift of resource availability as a result of climate change	-
Possible	-	Grazing Invasive weeds Psittacine Beak and Feather Disease (Pbfd)	-	-	-
Unlikely	-	-	-	-	-
Unknown	-	Bird and egg collection	-	-	-

**Table note:** Categories for likelihood are defined as follows:

**Almost certain** – expected to occur every year

**Likely** – expected to occur at least once every five years

**Possible** – might occur at some time

**Unlikely** – such events are known to have occurred on a worldwide basis but only a few times

**Rare or Unknown** – may occur only in exceptional circumstances; OR it is currently unknown how often the incident will occur

Categories for consequences are defined as follows:

**Not significant** – no long-term effect on individuals or populations

**Minor** – individuals are adversely affected but no effect at population level

**Moderate** – population recovery stalls or reduces

**Major** – population decreases

**Catastrophic** – population extinction

Elevated fine fuel hazard will be estimated based on the methodology and hazard classes described in the Overall fuel hazard assessment guide (Francis, Tolhurst, Wilson, & McCarthy, 2010). A summary of the classification system is provided in **Table 12-5**. The elevated fine fuel hazard largely determines if a fire will spread to the forest canopy or be maintained at ground level, where it is of little threat to arboreal fauna, including hollows used for breeding. Elevated fine fuel hazards that are high, very high or extreme have the potential to cause canopy fires.

### 3.7.4 Literature review and gaps

Descriptions of the matters based on literature reviews are described in **Section 3.7.1, 3.7.2 and 3.7.3** for RE 11.3.2, Vegetation Management REs and Black Cockatoo, respectively. A more in-depth literature review of habitat requirements for the Glossy Black Cockatoo has been completed given this species was assessed using species-specific habitat quality attributes (which required the development of a species-specific risk matrix) in addition to the standardised BioCondition, whereas RE 11.3.2 and the Vegetation Management Watercourse REs were only assessed using the standardised BioCondition assessment.

There were no evident gaps in the literature review that was completed for the matters of interest.

### 3.8 Starting habitat quality score

Habitat quality was assessed using BioCondition and Habitat Quality assessments spanning 43 vegetation units surveyed from May to July 2024. 21 vegetation units relevant to the MSES were surveyed. For further details about methodology and for raw data from each sampling location, refer to Part B of this report.

The maximum multiplier was used (multiplier of 4) to provide the most conservative estimate of improvement over time.

**Table 3-6 Starting Habitat Quality Scores**

Matter	Offset Matter area (ha)	Starting habitat quality score out of 100 (weighted average)	Habitat quality score after 20 years
<i>Of Concern REs</i>			
<b>RE 11.3.2</b>	130.07	53.12	7/10
<i>Vegetation management watercourse REs</i>			
<b>11.3.25</b>	175.16	59.55	8/10
<b>11.5.9</b>	152.14 as 11.5.9b	57.7	8/10
<b>11.5.9b</b>			
<b>11.10.1</b>	39.66 as 11.10.7	59.58	7/10
<b>11.10.7</b>			
<b>11.10.3</b>	26.55	75.43	8/10
<b>Total</b>	393.92	59.90	8/10
<i>Threatened Fauna</i>			
<b>Glossy Black Cockatoo</b>	241.55	34.11	5/10

### 3.9 Conclusion on suitability of offset site

The offset site meets the following criteria:

- The proximity to the impact site;
- The proximity to state and regional biodiversity corridors
- The same bioregion as the impact site, and
- Field verified biodiversity values



### 3.9.1 The Proximity to the Impact Site

The offset site location is located within the Bowen Basin subregion of the Brigalow Belt Bioregion, adjacent to the town of Dysart, Queensland, and is located approximately 6 km southwest of the impact location (the Project).

### 3.9.2 The Proximity to State and Regional Biodiversity Corridors

Within the eastern and central portion of the property there are large areas of remnant vegetation and areas of High-value Regrowth (HVR). The retention of these vegetated areas is presumably due to the difficult (steep) terrain and low fertility of the soils. Two waterways dissect the north (Philips Creek), and south (Stephens Creek), of the property from west to east. The waterways form a degraded connectivity corridor.

Riparian corridors classed as regional and state corridors under QLD waterway mapping dissect the offset area along these two waterways.

The offset area is within 2.5km of a biodiversity corridor of state significance, located to the south and west the connects the Carborough and Cherwell Ranges, and the Dawson and Boomer Ranges.

### 3.9.3 The Same Bioregion as the Impact Site

Both the offset site location and impact area are located within the Brigalow Belt Bioregion.

### 3.9.4 Field Verified Biodiversity Values

Habitat quality was assessed using BioCondition and Habitat Quality assessments spanning 43 vegetation units surveyed. (See Section 3.8).

## 4 Assessment against conservation outcomes

Specific outcomes and principles are required for the delivery of offsets. These are directly taken from the Queensland Environmental Offsets Policy v1.16 (2015) and reproduced in the subsections below.

### 4.1 Required outcomes of offsets

Offsets delivered under this framework are to achieve a conservation outcome for the impacted prescribed environmental matter(s). This will require the offset to maintain the viability of the prescribed environmental matter, relative to the status quo (i.e. what would have happened had the impact and the offset not occurred). This can be achieved by:

- Providing tangible benefits for the impacted prescribed environmental matter by providing an offset in the most strategic location to achieve a conservation outcome as follows:
  - wherever possible offsets should be delivered within a Strategic Offset Investment Corridor closest to the impacted site;
  - in the case of a land-based offset, the most strategic location to achieve a conservation outcome is generally located in the following order of preference (in relation to the impact):
    - the same local government area (LGA); or
    - the same sub-region; or
    - the same bioregion; or
    - adjacent bioregion.
- Effectively accounting for and managing the risks of the offset failing to achieve a conservation outcome, including risks from competing land uses such as timber, quarry material or mineral extraction which may be able to occur without the landholder's consent on state land. Information on existing timber, quarry material or mineral extraction which may be able to occur without the landholder's consent on state land and mineral interests can be found on the

Queensland Government Open Data Portal. For proponent-driven offsets, the risk should be managed as part of the offset delivery plan. This risk has been factored into the financial settlement calculation.

- Achieve the offset principles in section 1.5 of this policy.
- Being efficient, effective, timely, transparent, and scientifically robust.
- Having transparent governance arrangements—including being able to be readily measured, monitored, audited and enforced;
  - For proponent-driven offsets, offset delivery plans that are in force and associated reports being made publicly available on a relevant website.
- Including no more than 10% of an offset as research or education programs (unless a greater benefit to the impacted matter can be demonstrated).

## 4.2 Required principles of offsets

**All offsets must meet the following eight offset principles:**

- Offsets will not replace or undermine existing environmental and native title standards or regulatory requirements or be used to allow development in areas otherwise prohibited through legislation or policy.
- Impacts must first be reasonably avoided, then mitigated, before considering the use of offsets for any remaining impact.
- Offsets must reasonably avoid or minimise harm to Aboriginal and Torres Strait Islander cultural heritage to ensure the obligations under existing cultural heritage legislation are reflected.
- Offsets must achieve a conservation outcome that counterbalances the significant residual impact for which the offset was required.
- Offsets must provide environmental values as similar as possible to those being lost.
- Offset provision must minimise the time-lag between the impact and delivery of the offset.
- Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values.
- Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

## 5 Management objectives

The objectives of the ODP include:

- Enhance protection of the offset site from the threat of clearing for the duration of the impact;
- Improve BioCondition derived scores for RE 11.3.2 and Vegetation Management Watercourses REs within the offset areas; and
- Improve the habitat quality scores for Glossy Black Cockatoos by at least 2/10 over 20 years within the offset site.
- Manage the risk of weed invasion
- Manage the risk of feral pests
- Maintain fire regimes

If the above objectives are successfully achieved, the offset will lead to no net loss for the above matters as a result of the Project, as measured using developed completion criteria (Section 9.2).

## 6 Offset Completion criteria and performance targets

If an offset is to successfully achieve its objective of compensating for the Project's impacts on MSES the following must be achieved:

- Offsets will not replace or undermine existing environmental standards or regulatory requirements or be used to allow development in areas otherwise prohibited through legislation or policy.
- Impacts must first be avoided, then mitigated, before considering the use of offsets for any remaining impact.
- Offsets must achieve a conservation outcome that counterbalances the significant residual impact for which the offset was required.
- Offsets must provide environmental values as similar as possible to those being lost.
- Offset provision must minimise the time-lag between the impact and delivery of the offset.
- Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values.
- Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

Based on the Projected gains predicted in (see **Table 8-3**), the completion criteria are outlined in **Table 6-1**.

These completion criteria accord with SMART principles, being specific, measurable, achievable, relevant and time specific. They also allow a degree of flexibility in how the habitat quality gains are being achieved. For example, if grazing management does not deliver a forecast gain, additional weed control could be employed to achieve this. Furthermore, less-than-expected improvements in one assessment unit can be compensated for by greater-than-expected improvements in another assessment unit of comparable size and matter area.

To monitor the progress of the offset towards its completion criteria, five-yearly interim targets have been developed. These targets are to be assessed during the rounds of monitoring proposed in 2029, 2034, 2039 and 2044. Interim targets have been developed by assigning habitat attributes into two categories:

- attributes that will result in initial improvements within the first five-year period, then no subsequent changes (e.g., exposure to feral predators, grazing impacts on grass cover), and
- attributes that improve linearly throughout the duration of the offset (e.g., understorey species richness, number of large trees).

A summary of the proposed interim targets and completion criteria are provided in **Table 6-1** below. Additionally, key performance targets are presented in **Table 9-2** defining intervals of management activity and targets for:

- Pest abundance
- Weed abundance
- Buffel grass cover and
- Biomass levels

**Table 6-1 Interim targets and completion criteria**

MSES	Offset area (ha)	Habitat Score				
		Initial	Year 5	Year 10	Year 15	Year 20
<b>RE 11.3.2</b>	130.07	5.3/10	5.9/10	6.1/10	6.4/10	6.6/10
<b>Vegetation management watercourse REs</b>	393.92	5.9/10	6.5/10	7/10	7.5/10	8.1/10
<b>Glossy Black Cockatoo</b>	241.55	3.4/10	3.7/10	4.1/10	4.5/10	4.9/10

## **7 Risks of failure to achieve offset completion criteria/conservation outcome**

A risk assessment has been completed to assess the risk of failure to achieve offset completion criteria. The definitions of likelihood criteria for the risk assessment are shown in **Table 7-1** and the risk assessment matrix showing likelihood and consequence are shown in **Table 7-2**.

The risk analysis defines the various risks, determines the extent of vulnerabilities and devises remedial actions should the risk eventuate. The risk analysis also effectively accounts for and manages the level of risk associated with each threat identified in **Section 3.7.1.1, 3.7.2.1 and 3.7.3.4** (Threatening Processes for MSES) and any other threats that may impact the management of maintaining the viability of each prescribed environmental matter.

**Table 7-1 Definition of likelihood criteria for risk assessment**

Likelihood of risk occurring

Likelihood	Qualitative description	Quantitative description
<b>Almost Certain</b>	The event is expected to occur in most circumstances	May occur once a month or more frequently
<b>Likely</b>	The event will probably occur in many circumstances	May occur once every year
<b>Possible</b>	Identified factors indicate the event could occur at some time	May occur once every 2 or 3 years
<b>Unlikely</b>	The event could occur at some time but is not expected	May occur once every 5 years
<b>Rare</b>	The event may occur only in exceptional circumstances	May occur once every 10 years

**Table 7-2 Qualitative Risk Analysis Matrix**

RATING	CONSEQUENCES	LIKELIHOOD				
		Rare - 1	Unlikely - 2	Possible - 3	Likely - 4	Almost certain - 5
5	<b>Severe</b> - Permanent and/or very long term damage to areas of significant value, e.g. permanent loss of vegetation through pest invasion.	H	H	E	E	E
4	<b>Major</b> - Significant and/or long term damage to areas of high value, e.g. significant loss of vegetation through pest invasion.	M	M	H	H	E
3	<b>Moderate</b> - Moderate or medium term damage to areas of value, e.g. moderate loss of vegetation through pest invasion.	M	M	M	H	H
2	<b>Minor</b> - Minor and/or short term damage to areas of low value, e.g. minor loss of vegetation through pest invasion.	L	M	M	M	H
1	<b>Insignificant</b> - Insignificant or very short term damage to areas of very low or negligible value, e.g. insignificant loss of vegetation through pest invasion.	L	L	L	M	M

Low Risk (L)	Moderate Risk (M)	High Risk (H)	Extreme Risk (H)
Requires routine action	Requires moderate action < 1 Month	Requires priority action < 2 Weeks	Requires immediate action < 1 Week

Table 7-3 management objectives and risk of failure

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
<b>Force Majeure Events</b>								
<b>Mining of the offset site</b>	No production permits currently cover the proposed offset site. Exploration permits for coal and petroleum do not cover any proportion of the offset property. If mining were to take place within the offset site, this may result in the removal of habitat.	Rare	Critical	High	<p>The offset site has been positioned outside areas covered by existing production permits.</p> <p>The legal security over the site makes it known that the area is an offset. No available legal mechanism would render mining impossible within the offset site. However, a legally secured offset area is a prescribed matter under Queensland’s Environmental Offsets Regulation 2014 and any disturbance to one would require offsetting.</p> <p>If the landowner’s consent is needed for mining to occur, that consent will not be given.</p> <p>The Department is to be informed within 10 days of the landowner/approval holder becoming aware, or reasonably suspecting, that any of the following will or may occur:</p> <ul style="list-style-type: none"> <li>• Consultation process for issuing a new exploration license, mining lease, or mining approval,</li> <li>• Actual decision on issuing a new exploration license, mining lease, or mining approval, or</li> <li>• Any exploration or mining activities occurring on the land, or sufficiently close to the land to create a non-trivial risk of impacts on the land</li> </ul> <p>If any of the actions above occur, the landowner/approval holder will notify the license/lease/approval winner of the offset site and that any impact to it run a real risk of being significant, which would trigger a requirement to refer the proposal to the department.</p>	Rare	Critical	High
<b>Drought</b>	<p>Short dry periods coinciding with monitoring events can lead to misleadingly low habitat quality scores associated with grass cover and understory species richness.</p> <p>Prolonged droughts may result in slower tree growth rates than anticipated over a 20-year period, resulting in smaller habitat quality improvements than anticipated.</p>	Likely	Moderate	Medium	<p>Grazing will be closely managed within offset areas during times of drought to maintain a minimum cover of ground vegetation. Recent weather conditions are to be considered when assessing the results of monitoring against milestone criteria.</p> <p>No practical measures can be implemented to mitigate the effects of drought on tree growth and recruitment; however, habitat quality improvements resulting from tree growth and development constitute</p>	Likely	Minor	Low

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
	Extreme droughts may result in large-scale tree death, resulting in severe decreases in habitat quality score.				a minority of the total improvements anticipated and most improvements will occur even in the event of extended droughts.  In the event of large-scale tree death due to extreme drought, the approval holder and the Department will work together to determine an appropriate response.			
<b>Cyclones/ severe tropical lows/ flooding</b>	Severe cyclones can cause large-scale tree-felling, although such wind speeds are highly unlikely to occur away from the coast, such as where the offset site is located. Moderate damage (fallen limbs and reduced canopy cover) could occur but is not expected to have lasting impacts.  The most likely impact from tropical cyclones or tropical lows in subcoastal locations is heavy rain, leading to flash-flooding and erosion.	Likely	Moderate	Medium	No practical measures can be implemented to mitigate the risk of cyclones.  The offset site is in the upper catchment, where the risk of prolonged or severe flooding is minimal. Flooding is not expected to be of sufficient duration, and winds are not expected to be sufficiently severe, to cause substantial long-term harm to the site. Additionally, increased soil moisture following extreme storm events is expected to increase growth rates, likely assisting natural repair of any potential damage.  The risk of erosion will be managed by maintaining ground cover with <50% bare ground with native species.	Likely	Minor	Low
<b>Failure to Reduce Threat of Clearing</b>								
<b>Unauthorised access</b>	Unauthorised access to the offset area may result in the illegal harvesting of timber. It may also cause damage to vegetation through illegal camping and vehicles leaving tracks.	Unlikely	Moderate	Low	The offset area is located on a remote, private property where incursions by the public are infrequent.  Signage will be installed at all vehicle entry points, identifying the area as an environmental offset, within 12 months of the approval of the ODP.  The installation of any new planned fences will be completed within twelve months of the approval of the ODP.  Gates providing access from main roads will be locked.  Field monitoring will report on any evidence of timber harvesting.	Rare	Moderate	Low
<b>Herbicide drift from aerial spraying on neighboring properties</b>	Tree death can occur through herbicide drift in areas close to those where herbicide is applied. This risk is highest in areas used for cropping, where herbicide use is high, or in grazing areas where herbicides are used to control woody regrowth.	Unlikely	Major	High	The offset area is far from land used for cropping. It is also surrounded on most sides by vegetation that is protected under the Vegetation Management Act 1999 as endangered regional ecosystems. It therefore has a low risk of broadscale herbicide application.	Rare	Major	Medium



Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
<b>Inadvertent clearing by landowner due to misunderstanding about offset area boundaries or obligations</b>	<p>A failure to adequately communicate the ODP with the landowner could lead to clearing of parts or all the offset area.</p> <p>This risk is highest if a change in landownership takes place during the offset.</p>	Possible	Major	High	<p>Within 12 months of the approval of the ODP, a Voluntary Declaration will be registered over the offset area. The offset area will be mapped as category A regulated vegetation on Queensland Government mapping, which is the primary tool used by landowners to infer a right to clear.</p> <p>Signage is to be installed at all vehicle entry points, identifying the area as an environmental offset.</p>	Rare	Major	Medium
<b>Loss of Glossy Black Cockatoo habitat trees during thinning</b>	<p>A failure to adequately communicate this ODP with the landowner could lead to excessive thinning beyond that prescribed by the plan, resulting in long-term reductions in habitat quality scores for the Glossy Black Cockatoo.</p> <p>Inadequate training of thinning operators can lead to misidentification of woody tree species and accidental clearing of habitat trees.</p>	Possible	Major	High	<p>Any person engaged in thinning activities are to read and acknowledge the commitments in this ODP.</p> <p>Any person engaged in thinning activities must be able to accurately identify the following tree species: <i>C cristata</i>, <i>Allocasuarina leuhmannii</i>, <i>C. cunninghamiana</i>. OR all trees to be removed during thinning are to be clearly marked by a qualified person prior to any thinning activities.</p>	Unlikely	Moderate	Low
<b>Loss of Glossy Black cockatoo habitat, RE 11.3.2 habitat and watercourse vegetation due to inappropriate fire regime / controlled burn activities</b>	<p>Undertaking a controlled burn that is:</p> <ul style="list-style-type: none"> <li>• Inappropriately planned</li> <li>• Not suitably resourced</li> </ul> <p>May result in a fire intensity that causes the loss of species habitat</p>	Possible	Major	High	<p>All controlled fires must be planned by a suitably qualified and experienced person with the development of a controlled burn plan detailing resource requirements ensure suitable weather condition and conduct a fuel load and, moisture assessment. Controlled burns are to be mosaic in nature and not to be undertaken in Brigalow/<i>C. cristata</i> areas or RE 11.3.2 replanting zones. The area of each control burn must be less than 10% of the site and target high risk areas. Ecological burns are to consist of cold fires lit during the months of June, July, August and September when wind speeds are less than 5 km/h.</p>	Unlikely	Moderate	Low
<b>Failure to Reduce Threat from Feral Predators</b>								
<b>Control measures are insufficient to reduce invasive feral predator numbers</b>	<p>Invasive predators may become trap-shy and/or bait-shy and therefore not be susceptible to the control measures in place, resulting in an increase in numbers.</p> <p>Failure to maintain low feral predator densities may lead to an impact to small - medium native animal species through predation and also compete for resources, increased erosion, vegetation damage and/or increased weed species germination.</p>	Possible	Moderate	Medium	<p>A Pest Management Plan must be developed within 12 months of the offset establishment. The plan is to detail annual monitoring by suitably qualified and experienced persons. Quarterly monitoring is to be undertaken by the landholder.</p> <p>In the event new species or an increase in pest species is identified an Investigation for potential sources or reasons for an increase in pest animal numbers is to be undertaken and rectified.</p> <p>The pest management plan is to detail using a diverse range of control measures to reduce the risk of failure due to any</p>	Unlikely	Moderate	Low

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
					one method. Current control of pigs and wild dogs is undertaken via a baiting program on the property. This is augmented with shooting and trapping of wild pigs if numbers increase. Additionally, the Pastoral Manager, during quarterly inspections of the offset area may remove any wild cats, pigs or wild dogs that are seen.  If an increase in pig or dog activity is recorded, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.			
<b>Rapid recolonisation of predators from neighboring areas</b>	Removal of predators within small areas connected to other predator populations results in rapid recolonisation.  Failure to reduce feral predator densities will lead to may lead to an impact to small - medium native animal species through predation and also compete for resources, increased erosion, vegetation damage and/or increased weed species germination.	Likely	Moderate	Medium	Feral predator control over larger spatial scales is more likely to be effective than control over small scales, where recolonisation is rapid.  If monitoring reveals no effect of active pest management, the intensity and/or frequency of control measures will be increased to counter recolonisation.	Possible	Moderate	Medium
<b>Control of wild dogs leads to increased rabbit density</b>	Rabbit densities are currently low in the Isaac-Comet Downs subregion of the Brigalow Belt but may increase if relieved of predation pressure by cats and dogs. This may be balanced by predation by avian predators such as eagles. The overall risk is low, as populations of rabbits in central Queensland are likely limited by climate and other factors unrelated to predation (DPIF, 2008).	Unlikely	High	Medium	If five-yearly monitoring indicates that rabbit densities are reducing habitat quality attributes, a rabbit control program will be implemented. Otherwise, controls are expected to be unnecessary.	Rare	High	Low
<b>Increased Threat from Fire</b>								
<b>Unplanned or non-controlled fire in offset area.</b>	The impact of uncontrolled fire would be a reduction in dry matter yields and overall ground cover, thinning of the canopy, destruction of regrowth and emerging saplings and an overall slowing of the offset site achieving the completion criteria.	Likely	Moderate	Medium	The offset sites are comprised of remnant eucalypt species circa 10-32 m in height. These communities are adapted to fire and the risk of a 100% loss is low due to lower dry matter yields (fuel load) within the communities that are further managed with grazing. Controlled burns will be undertaken as a mosaic throughout the slopes within the offset site to minimise fuel loads and the risk of high intensity fires	Possible	Minor	Low

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
<b>Unplanned or non-controlled fire in Brigalow/ Casuarina cristata (Glossy Black Cockatoo habitat) offset area.</b>	Fire is likely to severely damage Brigalow / <i>C. cristata</i> vegetation communities. Casuarina, which will be planted in the same location as Brigalow, are less likely to be severely affected but if weeds are not controlled this risk could still be 'likely'.	Likely	Moderate	Medium	<p>Fires in Brigalow/ Casuarina vegetation communities are lower risk if the habitat is of good quality, particularly with a low density of weeds – in particular Buffel Grass (<i>Cenchrus ciliaris</i>). Areas with high weed or shrubs are highly susceptible to damage caused by fire.</p> <p>The site overall has a relatively low risk of fire with only 2 areas identified as High Risk of fire, development of fire breaks, targeted grazing and controlled burns of these areas along the slopes will reduce the risk of fire within areas of Glossy Black Cockatoo habitat.</p> <p>Managing fuel by controlled burning within Glossy Black Cockatoo habitat (Brigalow) is high risk and should be avoided. Overall risk can be lowered by selective grazing to reduce Buffel Grass, and/or careful burning in habitats adjacent to Brigalow to reduce the chances of unintended fires reaching Brigalow communities.</p>	Possible	Moderate	Medium
<b>Increased fire risk due to high fuel loads</b>	During periods when a low-level grazing regime has occurred alongside an average or above average wet season, there is an opportunity for fuel loads to accumulate to unacceptable levels. When this occurs and the high levels of fuel are present prior to summer, the risk of wild and/or high-intensity fires is exacerbated.	Possible	High	Medium	<p>Grazing management and feed biomass monitoring will be implemented to limit the risk of hot, uncontrolled fires. Biomass monitoring will be undertaken to ensure grazing only occurs in areas and times where suitable feed is available.</p> <p>In the event that pasture density cannot be reduced to appropriate levels by grazing alone, controlled burns will be implemented. If required, such burns would involve cold fires lit during the months of June, July, August and September when wind speeds are less than 5 km/h.</p>	Unlikely	Minor	Low
<b>Increased Threat from Weeds</b>								
<b>New infestations of restricted invasive weeds in the offset area.</b>	<p>Infestation of previously unidentified invasive weeds within the offset area.</p> <p>If weed infestation is unchecked, it may cause a significant deterioration in the offset site.</p>	Possible	High	Medium	<p>In the event new species are identified onsite an Investigation for potential sources, vectors or reasons for new infestation(s) will be undertaken with identified causes rectified.</p> <p>The offset area has only remote access and access to the offset area will be limited, to reduce/prevent pathogen/propagule transmission vectors.</p> <p>If a new weed infestation is identified, weed management measures will occur as per <b>Section 12.3</b>. Weed monitoring will target potential weed vectors such as access tracks, waterways, and property entries.</p>	Unlikely	Minor	Low

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
<b>Expansion of existing infestations of weed species in the offset area</b>	Increasing weed densities reduces habitat quality scores for the RE 11.3.2 and Vegetation Management Watercourse Res.	Likely	High	High	Investigate potential sources or reasons for an expansion of existing infestation(s) and rectify.  Access to the offset area will be restricted.  Chemical and/or mechanical control of restricted invasive plants in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.	Unlikely	Moderate	Low
<b>Failure of natural regeneration on Non-remnant and Disturbed areas</b>								
<b>Lack of the development of the overstorey tree recruitment and woody understory species</b>	The regeneration of woodlands is widely considered to be 'woody weeds' by landholders and regrowth vegetation management has traditionally focused on methods for controlling the development and spread of regrowth.	Likely	High	High	Identification and map the location of good candidate areas for restoration, with consideration of important regrowth locations that require repair and protection.  Allow regrowth / prevent further clearing of Brigalow, Poplar Box, and other vegetation types respecting pre-cleared veg type.  Avoid control action that may impact natural regrowth in disturbed remnant and non-remnant areas.  Identify the causes of the current state of species and communities. Engage a certified ecological professional to identify native species recruitment within non-remnant and disturbed areas of Poplar Box and Brigalow, and then apply control measures on invasive species and revegetation actions if necessary.  Grazing is to be managed across the site. Areas of low recruitment are to have cattle excluded until suitable recruitment occurs.	Unlikely	Moderate	Low
<b>Inappropriate Grazing Management</b>								
<b>Insufficient levels of grazing</b>	Vegetation communities present in the offset area naturally have a sparse grass cover with many patches of bare ground.  Dense herbage and grass cover that cure during the dry season is also associated with increased fire risk, which is a threat to all three matters.  However, over grazing significantly reduces native recruitment, impacting floral diversity. Grazing will be	Likely	High	Medium	The offset area is fenced to contain/exclude cattle.  Grazing of the offset area will be managed to maintain grass cover between 1200 kg per hectare and 2500 kg per hectare of feed. With cattle exclusion to be undertaken when feed is below 1200 kg per hectare and not reintroduced until 2500 kg per hectare of feed is present. The introduction of cattle will thin dense grass swards and provide a favorable ratio of grass to bare ground.	Possible	Moderate	Medium

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
	restricted to targeted activities in areas that are above a pasture dry matter yield of approximately 2,500 kg/ha available at the end of the dry season.				Vegetative groundcover is to be maintained between 20% (Approx 1200 kg per hectare of feed) and 33% (2500 kg per hectare of feed). The exact timing of cattle introduction and removal will be determined with consideration of pasture cover in conjunction with hectare of feed. The ground cover maintained in this range is likely to support a low-intensity fire, but unlikely to produce high-intensity fires.			
<b>Excessive levels of grazing</b>	<p>High intensity grazing over extended periods inhibits shrub and native perennial grass cover and slows the regeneration of habitat.</p> <p>Low vegetative groundcover increases the surface run-off of rainwater and encourages soil erosion.</p>	Likely	High	Medium	<p>Fences are in working order and allow for the exclusion of cattle when needed.</p> <p>Cattle are to be removed from the offset area when vegetative groundcover reaches a minimum of 20% (equivalent to a pasture dry matter yield of approximately 1,500 kg/ha), and no further rain is forecast. This will maintain protective cover to the soil from erosion.</p>	Possible	Moderate	Medium
<b>Thickening of woody vegetation</b>	<p>Prolonged grazing can promote regeneration of unpalatable trees through reduced competition with grass and reduced fire frequency. This can lead to dense stands of small-stemmed trees that compete with each other for resources and limit growth rates of individual trees.</p> <p>Inhibited growth as a result of high competition results in reduced habitat quality gains associated with Glossy Black Cockatoo foraging trees and increased number of large trees.</p>	Possible	High	Medium	<p>Ecological burns will be undertaken, as required, to reduce the stem density of the eucalypt vegetation when there is a density of &gt;750 immature trees/ha (DNRME, 2020). This is done to reduce competition for soil resources and therefore promote larger trees becoming established.</p> <p>Ecological burns are to consist of cold fires lit during the months of June, July, August and September when wind speeds are less than 5 km/h.</p>	Unlikely	Minor	Low
<b>Failure to Achieve Performance Targets</b>								
<b>Cumulative risks</b>	Minor consequences of multiple risks can combine to cause a failure to achieve and maintain interim performance targets and offset completion criteria.	Possible	High	Medium	<p>The Projected habitat quality gains used in the Offset Assessment Guide are considered conservative, as these are based on published scientific studies and the precautionary principle. Risk has also been incorporated into the Offset Assessment Guide outputs used for determining total offset area size. This means that the performance targets listed in <b>Section 6</b> can be lower than the gains actually expected and still achieve no net loss of the protected matters.</p> <p>Yearly monitoring of pest, biomass and weed within the site ensure ongoing targets are met. Bi-annual monitoring of non-remnant vegetation to ensure suitable recruitment. Ecological (Bio-condition, habitat quality and targeted species survey) monitoring performance every five years allows for the early detection of potential problems,</p>	Unlikely	High	Medium

Risk	Threats	Initial risk ranking*			Management measures/actions	Residual risk ranking*		
		L	C	R		L	C	R
					and the opportunity to enact alternate measures to achieve later rounds of performance targets.			

## 8 Demonstration of conservation outcomes

The offset, the subject of this delivery plan, will achieve a conservation outcome for the impacted matters by achieving a 2-point condition gain in habitat quality score over 70% of the offset site in 20 years. This will be achieved by managing the identified threatening processes, with specific focus on replanting, as well as fire management, weed and pest eradication.

For an offset to successfully achieve its objective of compensating for the project's impacts on MSES and demonstrating a conservation outcome, the following must be achieved:

- The offset area's weighted average habitat quality score for Vegetation Management Watercourse REs should be 8 after 20 years, when rounded to the nearest integer out of 10;
- The offset area's weighted average habitat quality score for Glossy Black Cockatoo should be 5 after 20 years, when rounded to the nearest integer out of 10;
- The offset area's weighted average habitat quality score for RE 11.3.2 should be 7 after 20 years, when rounded to the nearest integer out of 10; and
- The habitat quality scores are to have been generated using the same methodology and scoring system applied to assess the impact site and the starting quality of the offset site.

These completion criteria accord with SMART principles, being specific, measurable, achievable, relevant and time-specific. They also allow a degree of flexibility in how the habitat quality gains are being achieved. For example, if grazing management does not deliver a forecast gain, additional weed control could be employed to achieve this. Furthermore, less-than-expected improvements in one assessment unit can be compensated for by greater-than-expected improvements in another assessment unit of comparable size.

In order to monitor the progress of the offset towards its completion criteria, five-yearly interim targets have been developed. Assuming that offsets commence in 2025, the targets are to be assessed during monitoring proposed in 2030, 2035, 2040 and 2045. Interim targets have been developed by assigning habitat attributes into two categories:

- Attributes that will result in initial improvements within the first five-year period, then no subsequent changes (e.g., exposure to feral predators, grazing impacts on grass cover, and reduction of fuel load); and
- Attributes that improve linearly throughout the duration of the offset (e.g., basal area and diameter at breast height (dbh) of food trees, understorey species richness, number of large trees).

A summary of the proposed interim targets and completion criteria are provided below in **Table 6-1**.

### 8.1 Potential for habitat improvement

The potential for each attribute of habitat quality to be improved for each respective MSES through management is discussed in detailed in, **Table 8-1**, **Table 8-2** and **Table 8-3** (Glossy Black cockatoo, RE 11.3.2 and vegetation management watercourse REs).

Without management intervention, the habitat quality scores for all matters are likely to remain at baseline values, as the slight improvements in tree size that are expected over time will not be sufficient to shift scores out of 10 to the next integer.

The way in which habitat is anticipated to approved within the offset area is described in the section below for each of the matters.

#### 8.1.1 Glossy Black Cockatoo potential habitat improvement

Little can be done to improve most habitat values for the species, as habitat features such as hollows that take centuries to form are well outside the timeline of this offset. Other values are regional and outside the scope of the offset, such as the presence of habitat that may support the species' primary food tree, Belah (*Casuarina cristata*). The tree itself, however, can be cultivated on the offset areas and is fast growing. This is the most achievable management method as the reason the Belah tree is currently absent in most of the sample sites is almost certainly due to the presence of weeds, grazing of seedlings by

cattle and removal for agriculture. The improvement of the Brigalow management areas under the Commonwealth OAMP will include the planting of Belah seeds and/or tube stock, which are normally expected to be found in these areas as co-dominant.

Total food availability for Glossy Black-cockatoo is scored by total basal area of food trees, so the removal of any food trees (even saplings) could slightly lower habitat quality scores. This effect is expected to be small if thinning targets non-food trees and the smallest food trees. This is because larger trees contribute disproportionately to total basal area (the loss of small trees has a small effect), and the reduction in competition with other trees will encourage greater growth rates in the remaining large food trees. Long-term gains in food trees from thinning are expected to far outweigh any minor short-term losses.

Data on the growth rates of the Belah tree are difficult to find in situations comparable to the conditions on the offset site, however the tree is known to be particularly fast growing and it is expected that planted individuals will reach cone-bearing size (maturity) in approximately 10 years, and conservative estimates on younger regrowth sites locally suggest that an increase in the food supply alone will allow for 2 whole points out of 10 within the 20 years.

**Table 8-1 Potential for Habitat Improvement for Glossy Black Cockatoo**

Species-specific Habitat Attributes		
<b>Threat from fire</b>	On average, the Glossy Black-cockatoo management area possessed a fuel hazard score of “moderate” and most were in valleys, therefore scoring high as fire refuges. All of this habitat is contained in Brigalow areas subject to the management methods as outlined in the OAMP.	Fire is a risk to the Glossy Black Cockatoo management areas is to be managed by firebreaks. The fire risk score will not change as it is already low.  No improvement possible.
<b>Basal area of Glossy Black Cockatoo food trees</b>	The basal area of existing trees will expand over time. Many of the Glossy Black-cockatoo management areas (other than AU16) will be planted with the primary food tree of the species.	Improvements to the number of large trees have effects on Glossy Black Cockatoo Habitat, due to the importance of this habitat feature for these species. Such improvements have been factored into the calculations presented under “basal area of Glossy Black Cockatoo food trees” component of the habitat scoring matrix.  It is expected that the planting of the normally co-dominant <i>Casuarina cristata</i> as seeds or tubestock will produce mature trees in Brigalow sites will produce mature trees well within 20 years. Conservative estimates put the gain in basal area to be half of the expected basal area in a fully mature <i>Casuarina</i> thicket. This will gain 14.9/100 points overall. AU16 will show the least increases with the species being already well established.
<b>Number of large eucalypts &gt;50cm-dbh (probability of hollows of a suitable size)</b>	Given the slow rate of growth of large Eucalypts, these will not be managed for the Glossy Black-cockatoo.	Improvements to the number of large trees have effects on Glossy Black Cockatoo Habitat, due to the importance of this habitat feature for these species. Such improvements have been factored into the calculations presented under “basal area of Glossy Black Cockatoo food trees”  The size of Eucalypt trees is expected to increase within 20 years, though it is acknowledged that some may form large enough hollows, it is doubtful that enough will increase to a size to be of consequence to breeding outcomes for the species, which is not known to breed locally. No measurable improvement is likely in the timeframe of the offset.
<b>Quality and availability of habitat required</b>	Habitat connectivity is largely driven by the spatial configuration of habitat beyond the boundary of the offset site. One Statewide Biodiversity Corridor transverses the southern section of the offset area and a Regional Biodiversity corridor transverses the northern section of the	No improvement possible.



Species-specific Habitat Attributes		
for mobility	offset area. The offset sites and surrounding tracts of remnant vegetation are linked by vegetated corridors, particularly along creek lines (Figure 6). There is therefore no potential for improvement within the bounds of the offset site.	

### 8.1.2 Regional Ecosystem 11.3.2

Regional Ecosystem 11.3.2 was recorded in four BioCondition sites, within four separate AUs. These AUs include AU17 (non-remnant), AU18 (High-value Regrowth), AU19 (Remnant), and AU20 (Disturbed). The greatest concentration of AUs associated with 11.3.2 occur along the banks and fringes of Stephens Creek. Focusing restoration efforts along the portion of Stephens Creek within the Project boundary that flows east-west would have the greatest impact on improving values for these AUs and increase ecological values for the State Biodiversity Corridor.

It is proposed that restoration activities to improve AU's BioCondition values take place within a 500 m buffer of the centreline of Stephens creek. This area encapsulates 347.14 ha of 11.3.2.

**Table 8-2 Potential for Habitat Improvement for Regional Ecosystem 11.3.2**

Habitat attribute	Potential for improvement	Effect on overall habitat score
<b>BioCondition Components</b>		
Tree richness	<p>RE 11.3.2 has a tree species richness benchmark of 2. AU 18 (HVR) exceeds this benchmark at 175%. AU 17 (Non-remnant) fails to reach this benchmark at 50%. AU 19 (Remnant) and AU 20 (Disturbed) both exceed the benchmark by more than 200%, achieving 433% and 550% of the benchmark, respectively.</p> <p>Given the low threshold to achieve 100% of the benchmark (2 tree species), it is highly likely that AU 17 (Non-remnant) will reach this benchmark through natural regeneration.</p>	AU 17 (Non-remnant) increasing by an average of 50% and achieving benchmark is expected within the 20-year timeframe and will contribute to an increase of 3.2/100 in BioCondition score.
Shrub richness	<p>RE 11.3.2 has a tree species richness benchmark of 2. AU 17 (Non-remnant), AU 18 (HVR) and AU 20 (Disturbed) are within allowable excesses of the benchmark before being penalised, achieving 150%, 200%, and 125% of the benchmark, respectively.</p> <p>AU 19 (Remnant) was the only AU to exceed 200% of the benchmark, scoring 350%.</p> <p>Excluding cattle from offset areas will reduce pressure on species richness due to grazing.</p>	No improvement possible for RE 11.3.2
Grass richness	<p>RE 11.3.2 has a grass species richness benchmark of 9, all AUs were deficient of this benchmark.</p> <p>AU 17 (Non-remnant) and AU 18 (HVR) achieved 11% and 17, respectively while AU 19 (Remnant) and AU 20 (Disturbed) achieved both averaging 33% of the benchmark.</p> <p>As with the previous richness criteria, natural regeneration is likely sufficient to improve the grass species richness of these AUs. Buffel grass within sites is likely the greatest inhibitor to natural grass species recruitment. Removal of Buffel grass should be the main action taken should natural regeneration be insufficient to achieve grass species richness milestones. Excluding cattle from offset areas will reduce pressure on species richness due to grazing.</p>	<p>AU 17 (Non-remnant) grass species richness was very low so an increase of an average of 5 grass species (56% of the benchmark) over the 20-year timeframe is considered achievable. This would contribute to an increase of 3.1/100 in BioCondition score.</p> <p>For there to be any change in BioCondition score for AU 19 (Remnant) from grass species richness increase alone, the AU would have to see an increase of an average of 6 species. This would contribute to an increase of 5.2/100 in BioCondition score.</p>
Forb richness	RE 11.3.2 has a forb richness benchmark of 15. All AUs are deficient of this benchmark with AU 12 (Non-remnant) and AU 19	Over the course of 20 years, AU 17 (Non-remnant) should recover enough to have an increase to an average of 7 forb species (47%

Habitat attribute	Potential for improvement	Effect on overall habitat score
	<p>(Remnant) scoring the highest with 7% and 22% of the benchmark, respectively. AU 18 (HVR) and AU 20 (Disturbed) both scored zero.</p> <p>Forb richness will increase through natural regeneration over the course of the 20-year timeframe. However, selective planting of suitable groundcover species could aid in improving these values and ensure milestones are met. Excluding cattle from offset areas will reduce pressure on species richness due to grazing.</p>	<p>of the benchmark), this would contribute to an increase of 3.1/100 in BioCondition score.</p> <p>Similarly, AU 19 (Remnant) should also recruit more forb species naturally over time. A similar increase of an average of 7 species would contribute to an increase of 2.1/100 in BioCondition score.</p>
Recruitment	<p>RE 11.3.2 has a canopy species recruitment benchmark of 100%. Associated AUs are generally high, averaging 70% canopy species recruitment, however, only AU 18 (high-value Regrowth) achieved the 100% benchmark.</p> <p>AU 17 (Non-remnant) has an average recruitment of 50% and AU 19 (Remnant) has an average recruitment of 96%. These average recruitment levels are likely to increase over the 20-year timeframe through natural regeneration and are unlikely to require additional input through actions like replanting.</p>	<p>Increasing average recruitment in AU 17 (Non-remnant) to 75% of the benchmark will contribute to an increase of 1.9/100 in BioCondition score.</p> <p>An increase of 4% recruitment in AU 19 (Remnant) to benchmark levels will not contribute to an increase BioCondition score.</p>
Number of large trees	<p>Relatively minor improvements in the number of large trees are expected over the timescale of an offset (20 years). Based on studies in nearby Poplar Box woodlands, existing trees are expected to expand by 20% over 20 years (Back, Anderson, Burrows, &amp; Playford, 2009). Based on these projections, a small number of trees that are currently smaller than the threshold for a “large tree” will qualify as large trees after 20 years. Further improvements are possible by selective thinning of non-food trees and saplings to improve the growth rates of retained food trees. Back <i>et al.</i> (2009) found a 50% increase over 20 years in tree circumference in Poplar Box woodlands that had 80% of trees removed. Assuming the benefits of clearing are linear, with 0% clearing resulting in 20% increase in circumference and 80% clearing resulting in 50% increase, 30% clearing is expected to result in a 31% increase in circumference over 20 years.</p> <p>RE 11.3.2 has a large tree benchmark of 18 large trees/ha, all of which are to be <i>Eucalyptus</i>, with <i>E populnea</i> being the dominant species.</p> <p>All non-remnant 11.3.2 AUs within the candidate site were deficient in large trees falling short of the benchmark, with AU19 (Remnant) averaging 126% of the benchmark.</p> <p>The most cost-effective way of increasing the number of large trees would be allowing for the natural regeneration of the remaining deficient AU sites with the highest level of canopy species recruitment. AU 17 (non-remnant) has an average canopy species recruitment of 50% and AU 18 has 100%.</p>	<p>Allowing for the natural regeneration of large trees within AU 17 (Non-remnant) and AU 19 (Remnant), an average increase of 9 large trees across AU 17 is achievable in the 20-year offset timeframe and would contribute to an increase of 6.2/100 BioCondition score</p> <p>An increase in large tree numbers for AU 19 (Remnant) would not contribute to a BioCondition score increase, as these scores are already the maximum.</p>
Woody debris	<p>RE 11.3.2 has a coarse woody debris benchmark of 281 m. All AU's associated with this RE were deficient of this benchmark.</p> <p>AU 17 (Non-remnant) averages 3.4 m of coarse woody debris (1% of the benchmark) and AU 19 (Remnant) averages 32.9 m (12% of the benchmark). As the number of large trees and canopy cover increase within each AU, coarse woody debris will rise due to natural tree falls and branch shedding. If milestones for this criteria are not being met, it may be possible to increase the amount of coarse woody debris by dropping select trees and lopping branches, however, careful consideration must be made to number of large trees and canopy cover before such actions are implemented.</p>	<p>Increasing the woody debris naturally is expected to increase naturally in proportion to increase in large trees and will take significant time to increase from current levels to that of the benchmark. Actions taken to improve other habitat attributes will likely generate more natural amounts of woody debris without additional interventions.</p> <p>AU 17 (Remnant) was highly deficient in coarse woody debris. An increase on coarse woody debris to an average of 30 m within this AU would be achievable within the 20-year time frame.</p> <p>AU 19 (Remnant) averages 32.9 m (12% of the benchmark). It is expected that the coarse woody debris in this AU would increase significantly more than AU 17 (Non-remnant) due the number of large trees and canopy cover. An increase to an average of 145 m</p>

Habitat attribute	Potential for improvement	Effect on overall habitat score
		of coarse woody debris would contribute to an increase of 4.6/100 BioCondition score
Weed cover	<p>A total of 34 non-native plant species were recorded across the 115 offset sampling sites. Weeds comprised 0% to 99.25% of the understorey vegetation cover across sites. Over 25% (30 sites) had over 50% weed cover. Weed prevalence at the offset site was similar to the impact site, where weeds comprised at average of 34% of the understorey vegetation cover. The most widespread weeds were the pasture grasses <i>Melinis repens</i> (Natal Grass) and <i>Urochloa mosambicensis</i> (Sabi Grass). <i>Megathyrsus maximus</i> (Green Panic Grass) and <i>Cenchrus ciliaris</i> (Buffel Grass) was locally dominant in non-remnant pastures.</p> <p>Eight weed species recorded at the offset site are restricted plants under Queensland’s <i>Biosecurity Act 2014</i>: <i>Opuntia tomentosa</i> (Velvet Tree Pear), <i>Opuntia stricta</i> (Common Prickly Pear), <i>Lantana camara</i> (Lantana), <i>Cryptostegia grandiflora</i> (rubber vine), <i>Parthenium hysterophorus</i> (Parthenium), <i>Harrisia martinii</i> (Harrisia), <i>Jatropha gossypifolia</i> (Bellyache Bush), and <i>Parkinsonia aculeata</i> (Parkinsonia). Of these, Lantana and Rubber Vine pose the greatest risk to threatened fauna as they smother trees growing in riparian areas and potentially suppressing the growth of food trees (Tomley, 1995). Rubber Vine densities can be reduced through the judicious use of fire (Bebawi &amp; Campbell, 2002) or herbicide treatment (Department of Agriculture and Fisheries, 2023).</p> <p>There is little scope for reducing the density of other dominant weeds without significant cost, as these are largely pasture grasses. Exotic grasses are difficult to control due to fast growth rates and short generation times, alongside an absence of selective herbicides that do not kill native grasses.</p>	No Improvement likely
Canopy Cover	<p>RE 11.3.2 has a tree canopy cover benchmark 37%. AUs associated with RE 11.3.2 averaged a tree canopy cover percentage of 32.5%.</p> <p>AU 17 (non-remnant) and AU 18 (HVR) failed to reach the benchmark at 16% and 4% of the benchmark, respectively, while AU 19 (Remnant) and AU 20 (Disturbed) exceeded the benchmark at 102.7% and 194.6%, respectively.</p> <p>Increasing tree canopy cover will occur naturally overtime in AU 17 (Non-remnant). An increase to an average cover of 19% is achievable over the 20-year timeframe. AU 18 (HVR) had higher starting cover than AU 17 (Non-remnant) and will likely exceed the increase of 19%.</p> <p>Shrub cover mostly consisting of <i>Carissa ovata</i> exceeded the reference values at 2/3 of sampling locations in the offset site.</p> <p>Results above 200% of benchmarks incurs a penalty to final BioCondition scores, as such, it is advised that thinning of shrub cover within these AUs to reduce the overall shrub cover to appropriate levels.</p> <p>The primary cause of high shrub cover is likely to be selective grazing by livestock – allowing <i>Carissa</i> to grow in excess as it is selectively ignored at the expense of other species. Shrub cover is more amenable to management via fire than tree cover. Still, thinning manually is preferable to the use of fire in that it affords greater control over which shrubs and trees can be removed and retained. Thinning is also less likely to start fires that spread into Brigalow habitat. Removal of cattle will also improve shrub cover overall.</p>	<p>AU 17 (Non-remnant) will improve in shrub cover through natural regeneration, achieving benchmark levels in those assessment sites that were deficient. This increase will contribute to an increase of 2.2/100 BioCondition score.</p> <p>AU 19 (Remnant) and AU 20 (Disturbed) had their BioCondition scores penalised for exceed 200% of the benchmark. Thinning and removal of shrubs to benchmark levels will contribute to an increase of 2.5/100 in BioCondition scores for AU 19 (Remnant) and an increase of 4.4/100 for AU 20 (Disturbed)</p>

### 8.1.3 Vegetation management watercourse REs

The weighted average BioCondition score for Vegetation Management Watercourse REs is very high within the offset site (59.90/100, or 6/10 on average at the offset site and 67.85/100 or 7/10 at the impact site, see **Table 19-1**). This makes improvements very difficult as the baseline is very high and improvements get exponentially more difficult to achieve with each point gained. The EA stipulates that there is only 20.5 ha of vegetation management Watercourse REs within the impact site that require offsetting. The *QLD Offsets Policy 2014*, has a maximum requirement of four times the area of impact on each matter of State environmental significance (i.e. the maximum offset ratio for a matter is up to 1:4) for matters of State and local environmental significance. Therefore, under the state legislation that maximum land based offset requirement is 82 ha. The Offset site has **393.92 ha** of vegetation management watercourse REs. Therefore, in terms of quantity, the offset site will protect and manage **19 times** the amount of vegetation management watercourse REs, which is 16 times the maximum requirement under the Environmental offsets policy. Even though the expected improvements are limited, the offset site will protect this high-quality vegetation from future clearing and overall provide a net benefit to the matter being offset through this mechanism.

Regional ecosystems associated with Vegetation Management Watercourse (11.3.25, 11.5.9b, 11.10.7 and 11.10.3) were recorded within 26 BioCondition sites/sampling locations, within four separate AUs, with each AU categorised to each RE. The offset area contains 393.92 ha of Vegetation Management Watercourse REs

**Table 8-3 Potential for habitat improvement for Vegetation Management Watercourse Regional Ecosystems**

Habitat attribute	Potential for improvement	Effect on overall habitat score
<b>BioCondition Components</b>		
<p><b>Tree richness</b></p>	<p>A total of 21 sampling locations exceeded the reference values for tree richness, with an average of 116% of benchmark richness across all sites, though 5 sites were recorded as not achieving benchmark numbers.</p> <p>Lower scores for tree richness were mostly in non-remnant habitats, which is to be expected. It is likely that tree richness will increase as a natural consequence of the other management measures such as removal of cattle.</p>	<p>The following improvements are expected:</p> <p>11.10.7 – 0.30            11.3.25 – 0 (benchmark reached)            11.5.9b – 2.79            11.10.3 – 0.08            Total improvement, weighted for area – 1.12/100</p>
<p><b>Shrub richness</b></p>	<p>21 offset sampling sites exceeded the benchmark value for shrub richness, for these sites, no gains in BioCondition scores are possible by increasing shrub richness.</p> <p>Shrub richness may be increased where deficient by limiting livestock access to areas with excessive <i>Carissa ovata</i> cover as this species appears to be generally avoided by cattle, therefore if un-grazed, a greater variety of shrubs are likely to eventually grow. Control of <i>Carissa</i> may include careful burning.</p> <p>Shrub richness may also be improved by planting in strategic locations to act as source populations for deficient shrub species, as given the size of the offset site comprehensive planting is likely to be impractical.</p> <p>Excluding cattle from offset areas will reduce pressure on species richness due to grazing.</p>	<p>The following improvements are expected:</p> <p>11.10.7 – 0.38            11.3.25 – 0 (benchmark reached)            11.5.9b – 1.91            11.10.3 – 0.34            Total improvement, weighted for area – 0.8/100</p>
<p><b>Grass richness</b></p>	<p>3 offset sampling sites exceeded the benchmark value for grass richness, for these sites, no gains in BioCondition scores are possible by increasing grass richness.</p> <p>There is no strong correlation between Buffel grass presence (measured by cover) and native grass richness throughout the Offset site.</p> <p>Grass richness can be improved by thinning overhead shrub and canopy cover, optimising grazing intensity, or reducing weed cover.</p>	<p>Improving grass richness would generate improvements in watercourse BioCondition overall. The following improvements are expected:</p> <p>11.10.7 – 0.28            11.3.25 – 4.64            11.5.9b – 3.26            11.10.3 – 0.85            Total improvement, weighted for area – 3.42/100</p>
<p><b>Forb richness</b></p>	<p>Of the 26 offset AUs sampling locations, 7 met the forb species benchmark. 19 of the sampling sites contained fewer forb species than the benchmark value. Forb richness can be improved by thinning overhead shrub and canopy cover, optimising grazing intensity or by reducing weed cover. Forb richness was largely unrelated to weed cover at the offset site, with a range of weed coverage values for the deficient sites.</p>	<p>Improving forb richness would generate minor improvements in watercourse BioCondition scores. The following improvements are expected:</p> <p>11.10.7 – 0.44            11.3.25 – 4.73</p>

Habitat attribute	Potential for improvement	Effect on overall habitat score
	Limiting grazing will likely increase forb richness as livestock are likely to browse on a variety of native forbs; with livestock removed, native grazing/browsing species will continue to feed on forbs, however the overall pressure on these species is likely to be reduced.	11.5.9b – 3.26 11.10.3 – 0.85 Total improvement, weighted for area – 3.33/100
Recruitment	23 sites possessed 75% or more of seedlings and saplings of the dominant canopy species, with one site having (AU 23) 0 recruitment and two sites between 25%-75% (AU23 and AU40 respectively). Improvements will be possible by reducing cattle within the site and potentially by thinning the grass layer (physically or using fire), thereby creating space for seedlings of canopy species. In general, however, recruitment is considered a constraint on current habitat quality scores.	Improving recruitment in Watercourse RE/AUs to 75% would generate minor improvements to BioCondition scores (average of 0.1/100)
Number of large trees	<p>Relatively minor improvements in the number of large trees are expected over the timescale of an offset (20 years). Based on studies in nearby Poplar Box woodlands, existing trees are expected to expand by 20% over 20 years (Back, Anderson, Burrows, &amp; Playford, 2009). Based on these projections, a small number of trees that are currently smaller than the threshold for a “large tree” will qualify as large trees after 20 years. Further improvements are possible by selective thinning of non-food trees and saplings to improve the growth rates of retained food trees. Back <i>et al.</i> (2009) found a 50% increase over 20 years in tree circumference in Poplar Box woodlands that had 80% of trees removed. Assuming the benefits of clearing are linear, with 0% clearing resulting in 20% increase in circumference and 80% clearing resulting in 50% increase, 30% clearing is expected to result in a 31% increase in circumference over 20 years.</p> <p>Four of 26 Watercourse RE sampling sites recorded large trees within 50-100% of the benchmark and two sites greater than 100%.</p>	<p>Allowing for the natural regeneration of large trees the following improvements are expected:</p> <p>11.10.7 – 0.49 11.3.25 – 1.51 11.5.9b – 1.20 11.10.3 – 0.1</p> <p>Total improvement, weighted for area – 1.2/100 for large Eucalypts and 0.52/100 for non-Eucalypts.</p>
Coarse woody debris	<p>AU12 achieved the maximum possible score for total woody debris. The amount of woody debris at most sites is primarily a symptom of the long history of excessive stem densities of trees and shrubs locally, rather than recent mass tree death.</p> <p>Excessive woody debris could be reduced through controlled burns. In the long term, reducing the high density of small trees and encouraging fewer but larger trees would reduce total woody debris accumulation.</p> <p>For sites with insufficient woody debris, reducing fire frequency and allowing debris to accumulate to benchmark levels will be sufficient without further action. Hollow bearing trees felled during clearing operations within the disturbance footprint may be valuable if deposited in areas of insufficient woody debris.</p>	<p>Increasing the woody debris naturally is expected to increase naturally in proportion to increase in large trees and will take significant time to increase from current levels to that of the benchmark. Actions taken to improve other habitat attributes will likely generate more natural amounts of woody debris without additional interventions; the following improvements are expected:</p> <p>11.10.7 – 0.28 11.3.25 – 0 11.5.9b – 1.07 11.10.3 – 0.29</p> <p>Total improvement, weighted for area – 0.47/100</p>
Weed cover	A total of 34 non-native plant species were recorded across the 115 offset sampling sites. Weeds comprised 0% to 99.25% of the understorey vegetation cover across sites. Over 25% (30 sites) had	Some weed reduction is likely to occur; the following improvements are expected:

Habitat attribute	Potential for improvement	Effect on overall habitat score
	<p>over 50% weed cover. Weed prevalence at the offset site was similar to the impact site, where weeds comprised at average of 34% of the understorey vegetation cover. The most widespread weeds were the pasture grasses <i>Melinis repens</i> (Natal Grass) and <i>Urochloa mosambicensis</i> (Sabi Grass). <i>Megathyrsus maximus</i> (Green Panic Grass) and <i>Cenchrus ciliaris</i> (Buffel Grass) was locally dominant in non-remnant pastures.</p> <p>Eight weed species recorded at the offset site are restricted plants under Queensland’s <i>Biosecurity Act 2014</i>: <i>Opuntia tomentosa</i> (Velvet Tree Pear), <i>Opuntia stricta</i> (Common Prickly Pear), <i>Lantana camara</i> (Lantana), <i>Cryptostegia grandiflora</i> (rubber vine), <i>Parthenium hysterophorus</i> (Parthenium), <i>Harrisia martinii</i> (Harrisia), <i>Jatropha gossypifolia</i> (Bellyache Bush), and <i>Parkinsonia aculeata</i> (Parkinsonia). Of these, Lantana and Rubber Vine pose the greatest risk to threatened fauna as they smother trees growing in riparian areas and potentially suppressing the growth of food trees (Tomley, 1995). Rubber Vine densities can be reduced through the judicious use of fire (Bebawi &amp; Campbell, 2002) or herbicide treatment (Department of Agriculture and Fisheries, 2023)</p> <p>There is little scope for reducing the density of other dominant weeds without significant cost, as these are largely pasture grasses. Exotic grasses are difficult to control due to fast growth rates and short generation times, alongside an absence of selective herbicides that do not kill native grasses.</p>	<p>11.10.7 – 0.0</p> <p>11.3.25 – 5.23</p> <p>11.5.9b – 1.35</p> <p>11.10.3 – 0.39</p> <p>Total improvement, weighted for area – 2.88</p>

Habitat attribute	Potential for improvement	Effect on overall habitat score
<p><b>Canopy Cover</b></p>	<p>14 of the sampling sites met or exceeded the target values for foliage cover, at 2 sites to the extent that the BioCondition scores were penalised. Vegetation at offset sites had an average of 69% of the canopy cover of reference sites. The site with the densest vegetation (Site026) had a canopy cover that was 2× higher than the reference values. Woodland thickening could be a symptom of historical clearing activities (stimulating dense regrowth), fire suppression, or prolonged grazing (reducing competition between trees and grass). Once a heavy tree cover is established, it tends to be self-sustaining; low grass cover is maintained (even in the absence of further grazing) via heavy leaf litter fall and shade, further reducing the capacity of the understorey to carry a fire. Tree cover is therefore best reduced by thinning.</p> <p>Most of the sites that have excessive canopy cover are deficient in shrub cover, as is to be expected. Therefore, thinning canopy cover will ensure shrubs will also likely approach benchmark coverage levels, which is included in the calculation.</p> <p>Conversely, allowing growth in sites deficient in canopy cover will ensure much of the vegetation that comprises the shrub layer will be promoted to canopy cover over time, thus reaching levels closer to the benchmark. For sites with excessive <i>Carissa ovata</i> cover, the thinning of this species will allow for an increase in canopy species.</p>	<p>Shrub cover being thinned will not affect woody debris and is unlikely to affect organic litter but will increase grass cover, the following improvements are expected:</p> <p>11.10.7 – 0.48  11.3.25 – 0  11.5.9b – 2.59  11.10.3 – 0.08</p> <p>Total improvement, weighted for area – 1.2/100 for canopy and 0.72 for sub-canopy</p>



## 8.2 Averted loss

In addition to habitat improvements through managing weeds, feral animals and dense regrowth, environmental gains can be delivered by protecting land otherwise threatened by external factors. The Australian Government’s Offset Assessment Guide requires an estimate of risk of loss with and without offsets over the 20-year offset period. To calculate the background risk, historical clearing patterns were examined using data published for the Statewide Landcover and Trees Study. By overlaying data gathered between 2014 and 2019 with regional ecosystem mapping, the proportion of each land zone and vegetation management protection class that was cleared over the five years was calculated. Only freehold land was considered, to reflect risk at the offset site. The results of this analysis are presented in **Table 8-4**. As expected, vegetation with higher protection status (category B regulated vegetation) has a lower risk of loss than unprotected, non-remnant vegetation (category X vegetation). The weighted average risk of loss for the entire offset site is 11.9%.

**Table 8-4 Risk of loss of regulated vegetation on land zones present within offset site**

Land Zone	Category of regulated vegetation	Woody vegetation present in 2014*	Loss between 2014 and 2019*	Percentage loss over 5 years	Percentage loss over 20 years
3	B	1,354,296.6 ha	19,146.0 ha	1.41%	5.65%
5	B	890,237.2 ha	16,069.6 ha	1.81%	7.22%
5	X	1,721,556.3 ha	139,823.1 ha	8.12%	32.49%

## 8.3 Incidental impacts on other MSES

No threatened species other than the protected matters that are the target of the offset were recorded within the offset site. It is unlikely that the offset site provides important habitat for any non-target threatened species.

## 9 Management measures

All management measures for the offset area will be as per the described measures in the Federal Offset Area Management Plan (OAMP). The OAMP however also covers federal matters, which have management measures which are not relevant to the MSES covered in this report. Therefore, this plan only includes the management measures relevant for MSES as per the **Table 9-1** below. The associated cost of management measures is also included within **Table 9-1**. Costs associated with the management measures are subject to a commercially sensitive agreement and cannot be provided.

**Table 9-1 Management actions, triggers and corrective actions and associated cost**

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<b>Vegetation within the offset area is to be protected through a Voluntary Declaration under Section 19E and 19F of the VM Act.</b>	Whole offset area	The declaration is to be registered within 12 months of the approval of this report and is to remain in effect for the period of the EPBC Act approval, or until otherwise advised by the Minister in writing.	Vitrinite's Chief Operating Officer	The land manager is to undertake monthly inspections of the offset site to identify signs of unauthorised access and clearing.	The declaration fails to be registered within 12 months of the approval of this ODP.  Any activities in contravention of the Voluntary Declaration.	A failure to register the offset area within 12 months is to be immediately reported to the Australian Government. Upon being notified or becoming aware of prohibited forestry operations, native timber harvesting or clearing: <ul style="list-style-type: none"> <li>The land manager is to investigate the cause of the trigger (e.g., unauthorised access).</li> <li>The land manager is to assess how unauthorised persons accessed the site, review existing access restrictions, and inspect signage and offset area fencing within one week of detection of the clearing.</li> <li>The Approval Holder is to report the breach within 5 business days of being aware of the incident to the Australian Government consistent with any and all EPBC Act approval(s); and</li> <li>All actions required to prevent recurrence of the prohibited clearing (e.g., additional fencing, signage and/or security) will be completed within two months of detection of the clearing.</li> </ul>	The ODP
<b>Assess non-remnant areas of regrowth Brigalow/<i>Casuarina cristata</i> and 11.3.2 to assess requirement for additional management measures namely:</b> <ul style="list-style-type: none"> <li><b>Ripping to increase suckering and ground seed source set</b></li> </ul>	Zone A – 1 revegetation for RE 11.3.2 Zone A-2 – Replanting <i>C. cristata</i> ( <i>Gossy Black cockatoo habitat</i> )	Yearly for first 2 years and then every 5 years offset management.	Qualified ecologist engaged by Vitrinite	High density of dominant tree species of recruitment  One individual per 2m <sup>2</sup> for Brigalow and one individual per 8m <sup>2</sup> for 11.3.2	Areas of non-remnant Brigalow with poor recruitment present.  If recruitment is not naturally occurring within two years	Assess areas for preferred management measure of ripping or revegetation. <ul style="list-style-type: none"> <li>Undertake development and implementation of revegetation plan and / or</li> <li>Undertake ripping of areas that are identified as suitable (Category X/regrowth).</li> </ul> Ripping will be limited to areas of Category X/regrowth areas only, and only utilised for the purposes of managing the land for recruitment purposes of Brigalow.  Any revegetation activities need to consider the current species proportions within the	Revegetation plan

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<ul style="list-style-type: none"> <li>Revegetation (seed and/or tubestock).</li> </ul>						assessment area. <i>Acacia harpophylla</i> is to be dominant or co-dominant in all mapped Brigalow areas by the end of the management period.	
<b>Cattle-proof fencing is to be maintained surrounding the offset area and within feed paddocks.</b>	Whole site	When required, throughout the duration of offsets.	Land manager	Monthly inspections of fences and for signs that cattle are intruding into, or escaping from, fenced paddocks.	Fences are not cattle-proof. Signs of cattle encroaching into offset areas is present.	Fences are to undergo repairs within 10 days of a trigger, and escaping cattle returned to their appropriate paddock.  Incidents involving breaches of the perimeter fence by cattle are to be recorded in annual reports.	The ODP
<b>Signage is to be installed at each vehicular entry point into the offset area and kept in good repair throughout the duration of the offset. These signs inform visitors that the site is an offset area and unauthorised entry is prohibited. Authorised persons are those required to undertake actions described in this ODP, including the landholder, and approval holder and their contractors.</b>	Whole site	Within 12 months of the approval of this ODP.	Land manager, Vitrinite's Chief Operating Officer	Quarterly inspections of signage and entry tracks for signs of unauthorised access.	Signage is absent or illegible (damaged, faded etc).  Evidence of unauthorised access.	Regenerating shrubbery that obscures the sign is to be manually removed.  Damaged and illegible signs are to be replaced within one month of damage being detected.  Sign maintenance is to be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the approval holder.  Evidence of unauthorised entry will trigger increased surveillance, fencing or signage, depending on the likely route of entry.	The ODP
<b>Implement baseline assessments, and completion of management plan development detailing and monitoring and reporting program</b>	Whole site	Within 6 months of Offset establishment	Ecologists contracted by Vitrinite	Completion of Management plans for: <ul style="list-style-type: none"> <li>Pests</li> <li>Weeds</li> <li>Grazing / biomass</li> </ul>	Establishment of offset	If these reports are not developed within 6 months relevant authorities must be notified and task completed	The ODP

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<b>Monitoring of:</b> - <b>Pest</b> - <b>Weed</b> - <b>Grazing / biomass</b>	Sampling sites	As detailed within management plans (expected every 12 months).	Ecologists contracted by Vitrinite	Completion of monitoring	Detailed reports of monitoring.	The numbers of each species observed are to be recorded for each round of monitoring, as a record of relative population size over time. Weeds are to be monitored concurrently for signs of any infestations of restricted weeds not previously known to occur within the offset area.  Records are to be kept after each inspection, and all records are to be used to prepare an Annual Offset Area Report	Pest management plan  Weed management plan
<b>Habitat Quality Monitoring</b>	Sampling sites	Habitat quality scores / BioCondition (as required) for the MSES outlined in this ODP. - Mar-May in 2029, 2034, 2039 and 2044.	Ecologists contracted by Vitrinite	BioCondition scores; and tailored, species-specific, fauna habitat quality scores.	Habitat quality scores / BioCondition (as required) for the MSES outlined in this ODP.	Monitoring is to be undertaken by qualified ecologists or botanists with experience in ecosystems of the Brigalow Belt. Monitoring is to be undertaken at the same 88 Tay-Glen sites used for the initial offset area assessment	The ODP
<b>Erosion and the risk of erosion will be managed by maintaining ground cover with &lt;50% bare ground with native species.</b>	Sampling sites (BioCondition bare ground cover) and whole site	When required, throughout the duration of offsets.	Land Manager, Qualified ecological consultant	Monitoring within the first 2 years to including mapping of existing erosion, and areas at risk of erosion.	Erosion areas increase throughout the offset area.	Areas where erosion is present are to be excluded from any cattle grazing efforts, allowing for groundcover of native species to regenerate.  If erosion is extreme, an erosion specialist is to be consulted, and management plan created to minimise and resolve the erosion.	The ODP
<b>Rubber Vine is to be actively controlled in accordance with the Department of Agriculture and Fisheries' (2023) Rubber vine factsheet. Where practicable, cut-stump method should be employed to limit collateral damage to neighbouring</b>	Whole site (zone A and B)	Initial treatment is to be completed within the first five years of the offset, with further treatment as required throughout the duration of the offset.	Land Manager, Qualified ecological consultant	Five-yearly monitoring is to include mapping of existing Rubber Vine infestations.	Rubber Vine present in clumps exceeding 5m diameter.  Individual Rubber Vine plants extend higher than 3m into trees.	If threshold infestations of Rubber Vine are detected during five-yearly monitoring, the land manager is to implement weed control measures within six months of the monitoring. Weed control measures are to be in accordance with the (Department of Agriculture and Fisheries, 2023) <i>Rubber vine</i> factsheet. The cut-stump or foliar spray methods are likely to be most effective for scattered infestations.  For medium to dense infestations, slashing close to ground level and stick-raking can be	Weed Management Plan

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
vegetation through herbicide application. Large infestations are to be foliar sprayed or managed with fire.						<p>utilised. Follow up herbicide control is essential after this control method. Only rubber vine is to be removed with this control.</p> <p>Treatments are to be recorded in annual reports.</p>	
<p><b>Active weed control is to be implemented whenever a new restricted invasive plant listed under the <i>Biosecurity Act 2014</i> (Qld) is detected within the offset area or when existing weeds occur in infestations that cover &gt;10% of the offset area's ground surface.</b></p>	Whole site	When required, throughout the duration of offsets.	Land Manager, Qualified ecological consultant	<p>Novel infestations of restricted invasive weeds are to be searched for along tracks, watering points (water ways and infrastructure) and cattle yards (if any) during quarterly inspections of the offset area by the land manager.</p> <p>Total weed cover is measured at permanent monitoring locations every five years.</p>	<p>Restricted invasive plant cover &gt;10% of the offset area's ground surface.</p> <p>A new restricted invasive plant listed under the <i>Biosecurity Act 2014</i> (Qld) is identified within the offset area</p>	<p>Upon being notified or becoming aware of new restricted invasive plant listed under the <i>Biosecurity Act 2014</i> (Qld) or restricted invasive plants occupying greater than 10% of the offset area, the land manager is to implement pest control measures within one month. These measures may include, and are not limited to:</p> <ul style="list-style-type: none"> <li>• foliar spraying</li> <li>• basal bark spraying</li> <li>• stem injection</li> <li>• cut stump</li> <li>• cut and swab</li> <li>• stem scraper</li> <li>• wick applicators.</li> </ul> <p>Control measures should be determined based on recommended methods published by the Department of Agriculture and Fisheries which can be found via this link:  <a href="https://www.publications.qld.gov.au/dataset/invasive-plant-weed">https://www.publications.qld.gov.au/dataset/invasive-plant-weed</a></p> <p>Treatments are to be recorded in annual reports. Follow-up retreatment is to take place until further corrective actions are no longer triggered (the novel weed infestation has been eradicated or weed cover returns to &lt;10%).</p>	Weed Management Plan

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<p><b>Grazing is to be managed to ensure vegetative groundcover is not to be reduced below 20% (approximately 1,500 kg/ha). Once vegetative groundcover is reduced to 20% and no rain is forecast in the coming week, cattle are to be removed from the offset area and not returned until groundcover is above 30% (approximately 2,500 kg/ha). Stocking rates should be calculated and enacted to maintain feed above 1,500 Kg, unless targeted Buffel grass reduction is being undertaken for a short period.</b></p> <p><b>If dry periods occur (drought), grazing will be closely monitored and managed accordingly to maintain a minimum cover of ground vegetation.</b></p>	Whole site	Throughout the duration of the offset.	Land manager	<p>Land manager is to keep records of the stocking rate and stocking period each year. Yearly Biomass Assessments are to be conducted on proposed targeted grazing areas. The Land manager is to estimate vegetative groundcover during regular inspections while cattle are present.</p> <p>Other habitat attributes measured during five-yearly monitoring (e.g., “species richness of grass and forbs” and “weed cover”), should also improve or be maintained with appropriate grazing intensity.</p> <p>Monitoring of large tree native recruitment is to be undertaken.</p>	<p>Biomass assessment concludes less than 1,500kg/ha / below 20% vegetation groundcover.</p> <p>Drought (short to extreme).</p>	<p>A failure to achieve interim performance targets will trigger the following response:</p> <ul style="list-style-type: none"> <li>Consult the annual reports to determine compliance with the ODP.</li> <li>If failures occurred despite full compliance, the rotation program is to be amended according to the direction of the failure; longer periods of grazing and/or higher stocking rates are recommended in instances where grass cover is excessive, while shorter periods of grazing and/or lower stocking rates are recommended in instances of insufficient grass cover.</li> <li>If drought occurs, appropriate responses and management will be determined by approval holder and the Department.</li> </ul>	Biomass monitoring plan
<p><b>A pest monitoring and control program is to be implemented, which targets rabbits, dogs, cats, foxes and pigs using a range of techniques including baiting, shooting and trapping. Participate</b></p>	Whole site	Throughout the duration of the offset.	Land Manager, Qualified ecological consultant	<p>A baseline survey must be undertaken as part of a pest management plan development.</p> <p>Additionally, quarterly surveys by the land manager involving 4 daylight</p>	<p>Observed increase in the number of pest animals recorded per 8-hour survey above baseline levels and/or previous monitoring event (whichever is lower).</p>	<p>Observations of a large number of feral animals will trigger an increase in control effort expended until a resulting decline in feral animal numbers is observed and maintained.</p> <p>If triggers continue, the Pastoral Manager or Landholder is to approach neighbouring landowners to reach an agreement regarding the implementation of a larger-scale</p>	Pest management plan

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<p><b>fully in, and cooperate with, any and all regional pest control programs, except those that contravene a part of this ODP.</b></p> <p><b>Pest abundance is to be less than 5% of the baseline levels by the end of the 20 year monitoring period.</b></p>				<p>hours + 4 nighttime hour surveys during a single 24-hour period will be undertaken to determine the number of pest animals detected per survey.</p> <p>Camera traps should also be placed for a minimum of 14 nights, along areas of interest and high-risk vectors including:</p> <p>Water ways and infrastructure</p> <p>Fencelines and Gates</p> <p>Vehicle Tracks</p> <ul style="list-style-type: none"> <li>Observed animal trails and tracks.</li> </ul>		<p>integrated pest control program, to slow recolonisation of the offset area.</p> <p>Control programs should be based and implemented on strategies and plans provided by 'pestsmart', which is managed by the 'Centre for Invasive Species Solutions' and funded by the Department of Agriculture, Fisheries and Forestry.</p> <p>Control programs should include (but not be limited to):</p> <ul style="list-style-type: none"> <li>Baiting (1080) (minimum 14 days)</li> <li>Padded Jaw Trapping &amp; Shooting (minimum 10 days)</li> <li>Drop-gate trap, panel trap and box trap.</li> <li>Night/Spotlight Shooting (minimum 4 consecutive nights)</li> <li>Warren destruction via ripping (depending on area)</li> </ul> <p>If using 1080 baiting strategy, it is important that notice is given to neighbouring properties, and baits are removed/buried after 2 weeks, with carcasses also removed a minimum of 14 days after removal/burial of baits.</p> <p>Padded Traps are to be checked daily (every morning). If traps are reset and active throughout the day, they need to be checked in the afternoon also.</p> <p>Timing of the control programs should target the species breeding season:</p> <ul style="list-style-type: none"> <li>Rabbits – Spring and Summer</li> <li>Dogs – April - June</li> <li>Foxes – June – July</li> <li>Pigs – All Year</li> <li>Cats – Spring and Summer</li> </ul>	



Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<p><b>Fire breaks are to be maintained around all external boundaries of the offset area. Fire control lines must be inspected quarterly. Maintenance must be undertaken as required and at least once every two years.</b></p> <p><b>Targeted grazing is to occur in areas identified as high and very high fire risk to minimise ground cover.</b></p> <p><b>If one or more bushfires are current in the region and considered potentially threatening to the site, coordinate with all relevant fire authorities to determine the appropriate method of protecting the site (if the relevant fire authorities advise against protecting the site from a specific fire, the approval holder may comply with that advice without needing approval or agreement)</b></p>	Zone B (targeted cattle grazing) and whole site	Throughout the duration of the offset.	Land manager	<p>Occurrence of unplanned and uncontrolled fires within the offset area is to be monitored by the land manager quarterly.</p> <p>Firebreaks to be monitored quarterly for vegetation growth.</p>	<p>Occurrence of an unplanned and uncontrolled fire within the offset area.</p> <p>Firebreaks overgrown and not meeting requirements as a Firebreak.</p>	<p>An uncontrolled fire will trigger the following response once controlled:</p> <ul style="list-style-type: none"> <li>Identify the source of the fire, and which fire breaks failed to contain it.</li> <li>Repair any damage to fencing and/or water trough infrastructure.</li> <li>Exclude cattle until the end of the following wet season to allow recovery and regeneration of vegetation.</li> <li>Report the fire within the annual report; and</li> <li>Based on the damage to habitat quality attributes resulting from the fire, reassess the fuel load reduction practices and the width of fire breaks at the offset site.</li> </ul> <p>If a Firebreak is found to be overgrown prior to any unplanned/uncontrolled fires break out, maintenance must be taken within one month to minimise ground cover.</p>	The ODP
<p><b>Mosaic prescribed; controlled burns are to be undertaken regularly to:</b></p> <ul style="list-style-type: none"> <li>Reduce fuel loads</li> <li>Control Buffel grass</li> </ul>	Whole site	As required, but primarily within the first 10 years of the offset.	Land manager Qualified ecological consultant	The timing of prescribed burns is to be recorded by the land manager, along with a map of each fire scar.	>25% of the offset area burnt in any 12-month period. Scorch height of fires >5 m.	<p>A fire that is hotter or more extensive than planned will trigger:</p> <p>A review of the controlled burning practices (timing and wind conditions permissible); and</p> <p>An assessment of whether prolonged cattle exclusion (longer than one wet season) is required to facilitate tree regeneration.</p>	The ODP

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<ul style="list-style-type: none"> <li>Reduce overly dense regrowth of small trees and shrubs.</li> <li>Assist in Buffel grass control or to control Rubber Vine infestations.</li> </ul> <p>If required, such burns would involve cool fires lit during the months of June, July, August and September when wind speeds are less than 5km/h.</p> <p>Planned and controlled ecological burns are to be restricted to &lt;25% of the offset area in any 12-month period.</p> <p>Cattle are to be removed prior to the fire and not returned until after the following wet season.</p>				The impact of fire on habitat quality attributes will be assessed as part of the five-yearly monitoring of the offset area.			
<p><b>Removal of Category X/regrowth within access tracks and fire management lines associated with fences. Construction and maintenance of access tracks, fencing and fire lines will be undertaken in accordance with the requirements of the VM Act. Any vegetation clearing required for fencing, access or fire lines must be undertaken in</b></p>	Whole site	When required, throughout the duration of offsets.	Land manager Qualified ecological consultant	Annual reports are to contain a description of all clearing activities undertaken within the offset area, and how this clearing accorded with this ODP and the VM Act.	Clearing wider than 10 m for tracks, fences and fire management lines.  Any clearing undertaken that is not for track, fence and fire management for the purpose of the offset.	Unauthorised clearing (clearing not in accordance with the OAMP, ODP and/or VM Act) may constitute a further significant residual impact. All potential instances of clearing not in accordance with the ODP and VM Act will be reported to DETSI and other relevant parties (e.g DCCEEW).	The ODP

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
<p>accordance with best practice management methods and any applicable legislative requirements (e.g., be less than 10 m wide).</p> <p>Clearing of Category X/regrowth is limited to the purposes of maintaining the access tracks and fire management lines associated with fences only. This in turn allows management of the land for the purposes of offsets. This clearing will maintain a lower chance of unplanned/uncontrolled fires within the offset, and ensure fencing is kept intact, so cattle or other factors cannot enter the offset areas.</p>							
<p><b>Implement monitoring and reporting program described in Section 12</b></p>	Whole site	Weekly - (Pasture cover (biomass), condition of water points.	Land manager	An Annual Offset Area Report is to be prepared and submitted every 12 months from the date of the approval of the ODP, as a quality assurance/quality control that management measures are being undertaken in accordance with the ODP	When pasture condition indicates that cattle are soon to be removed, or when water levels in dams are low), more regular inspections (weekly) may be necessary	Record, monitor and report. Replace damaged signage, fences and nourish tracks and firebreaks	The ODP

Management Measure	Management zone	Timing	Responsibility	Performance Monitoring	Performance Trigger	Corrective Actions	Relevant plans
	Whole site	Monthly – (Signage, condition of tracks, fences and fire breaks)	Land manager	The land manager is to undertake regular inspections of the offset area, which involve driving along the major tracks and fence lines	Unauthorised personnel accessing to the Site, cattle records in no-go zones, lack of signage, fence and gate maintenance.		The ODP
	Whole site	Quarterly	Land manager Qualified ecological consultant	Pest animals are to be monitored quarterly, by spending four daylight hours and four night-time hours searching for feral animals within the offset area. The numbers of each species observed are to be recorded for each round of monitoring, as a record of relative population size over time	The numbers of each species observed are to be recorded for each round of monitoring, as a record of relative population size over time.		Pest Management Plan

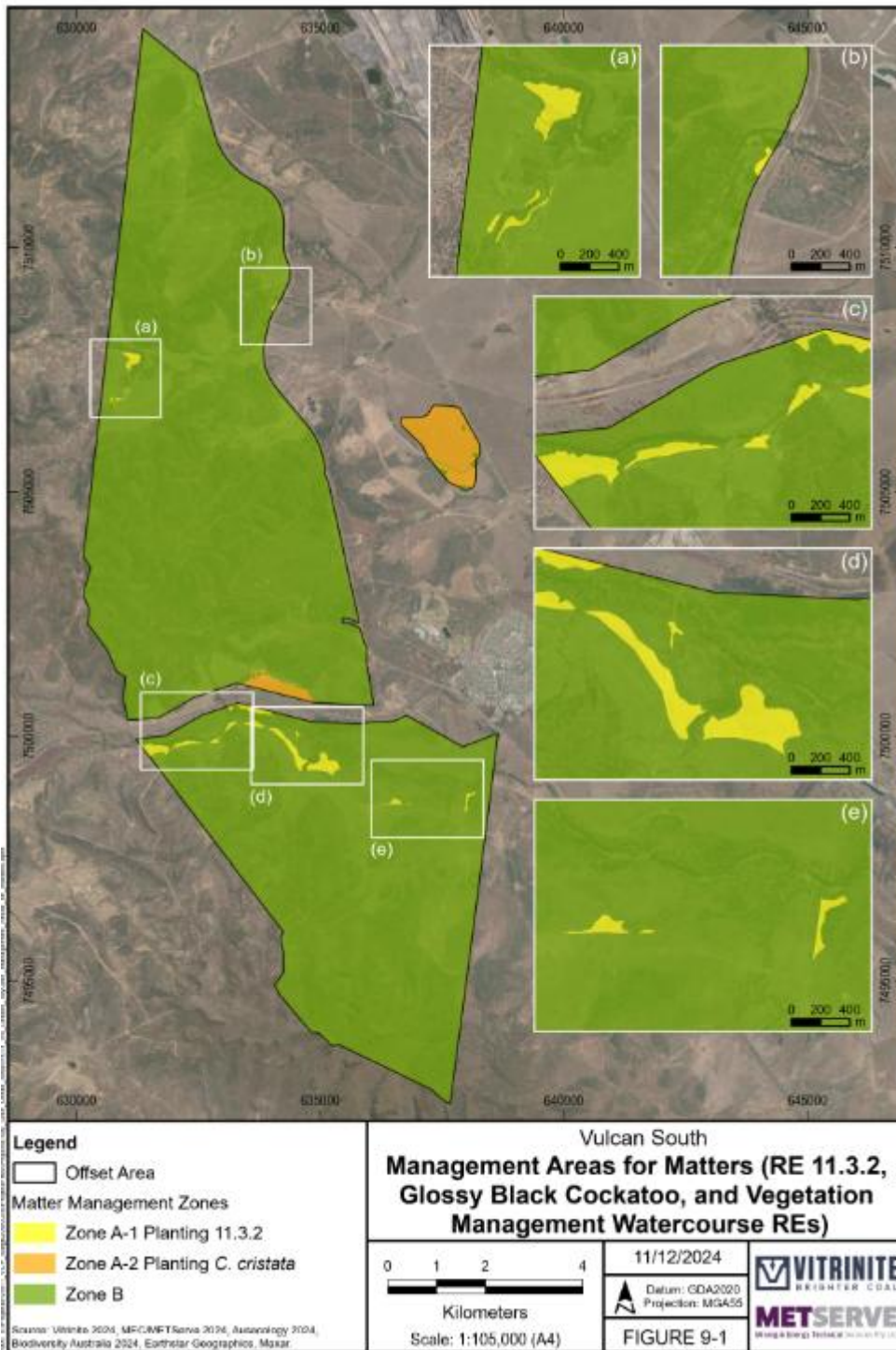


Figure 9-1 Management areas for matters (RE 11.3.2, Glossy Black Cockatoo and Vegetation Management watercourse REs)

## 9.1 Management Zones for MSES matters

Management zones for all matters is divided into the following categories (**Figure 9-1**):

- Zone A: Revegetation (cattle exclusion, weeding and erosion control)
  - revegetation/planting (relevant to RE 11.3.2 and *Casuarina cristata* planting)
- Zone B (controlled burning and all other non -replanting actions)
  - All other management actions (weeding, erosion control, fire control etc).

Zone A will also include cattle exclusion, weeding and erosion control.

### 9.1.1 Management Zone A-1: Replanting – RE 11.3.2 (Poplar Box)

Management Zone A-1 will include the revegetation of RE 11.3.2 (Poplar box) within the identified revegetation zones. The revegetation zone will include cattle exclusion fencing to prevent cattle trampling on new growth and increasing the erosion risk. The revegetation zone will also be excluded from any controlled fire activity whilst the trees are still young. This management zone will also include weed, pest and erosion monitoring.

### 9.1.2 Management Zone A- 2: Replanting – *C. cristata* (Glossy Black cockatoo habitat)

Management Zone A-2 will include the revegetation of *C. cristata* (Glossy Black cockatoo habitat) within the revegetation zones. The revegetation zone will include cattle exclusion fencing to prevent cattle trampling on new growth and increasing the erosion risk. The revegetation zone will also be excluded from any controlled fire activity given the replanting zones are in regrowth Brigalow areas which are generally not very fire tolerant. This zone will also include weed, pest and erosion monitoring.

### 9.1.3 Management Zone B – all other management actions

This zone will include strategic cattle grazing areas (therefore no cattle exclusion zones aside from cattle fencing around the perimeter of the offset site), areas pertaining to controlled bushfire mosaic burning, as well as weed, pest and erosion monitoring. There will be no planting in these areas of the offset site.

## 9.2 Performance completion targets

The projects performance completion targets and the timeframes associated with these are summarised in **Table 9-2**.



Table 9-2 Performance completion targets and timeframes

Performance Criteria	Offset Year																				
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
<b>Infrastructure Targets</b>																					
Signage & Voluntary Declaration	█																				
<b>Vegetation Assessments</b>																					
Assessment of regrowth Brigalow/ <i>Casuarina</i> (Glossy Black Habitat), Vegetation Management Watercourse Res and RE 11.3.2 areas for additional management actions	█	█			█					█					█						█
All matter areas must improve in BioCondition score by 2/10																					█
<b>Habitat Quality Monitoring</b>																					
Habitat Quality Assessments					█					█					█						█
<b>Weed Management</b>																					
Initial control of all identified Rubber Vine	█				█																
Removal of all restricted weeds identified during year 1 of surveys	█									█											
Weed cover to be less than 40% of baseline density				█																	
Weed cover to be less than 30% of baseline density								█													
Weed cover to be less than 20% of baseline density												█									
Weed cover to be less than 10% of baseline density																█					
Weed cover to be less than 5% of baseline density																					█
Buffel cover in Brigalow/ <i>Casuarina</i> and Poplar regeneration areas to be 40% or less				█																	

Performance Criteria	Offset Year																			
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Buffel cover in Brigalow/ <i>Casuarina</i> and RE 11.3.2 regeneration areas to be 30% or less								█												
Buffel cover in Brigalow/ <i>Casuarina</i> and RE 11.3.2 regeneration areas to be 20% or less												█								
Buffel cover in Brigalow/ <i>Casuarina</i> and RE 11.3.2 regeneration areas to be 10% or less																█				
Buffel cover in Brigalow/ <i>Casuarina</i> and RE 11.3.2 areas to be 5% or less																				█
<b>Pest Management</b>																				
Pest abundance to be less than 40% of baseline density				█																
Pest abundance to be less than 30% of baseline density								█												
Pest abundance to be less than 20% of baseline density												█								
Pest abundance to be less than 10% of baseline density																█				
Pest abundance to be less than 5% of baseline density																				█
<b>Biomass Monitoring</b>																				
Biomass survey to be conducted every 5 years by an ecologist					█					█					█					█
Grazing areas to maintain biomass of fuel load / grass load between 1,500 – 2000 kg /ha																				
<b>Fire Management</b>																				
Maintenance of fire breaks		█		█		█		█		█		█		█		█		█		█

Performance Criteria	Offset Year																			
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fuel load to be assessed and a mosaic prescribed; controlled burn to be conducted if required.																				

### 9.3 Roles and responsibilities

The persons responsible for undertaking the tasks described in the Offset delivery Plan are listed in the table below (Table 9-3).

**Table 9-3 Roles and responsibilities**

Person/position	Duties
<b>Offset land manager</b>	<p>Oversee compliance with the voluntary declaration under the VM Act.</p> <p>Maintain fences, access tracks and fire breaks.</p> <p>Manage rotation of cattle grazing.</p> <p>Install, inspect and maintain dams, bores and troughs.</p> <p>Maintain entry signage.</p> <p>Undertake quarterly weed and pest animal monitoring and management.</p> <p>Undertake / partake in Ecological burns in accordance with this OAMP.</p> <p>Undertake regular site inspections and make available all data gathered during these inspections to Vitrinite's Chief Operating Officer for annual reporting.</p> <p>Undertake Biomass assessment for strategic grazing</p> <p>Contact Vitrinite's Chief Operating Officer in the event of becoming aware of a reportable incident.</p>
<b>Vitrinite's Chief Operating Officer</b>	<p>Register the offset area with a voluntary declaration under the VM Act.</p> <p>Arrange for signage to be prepared and installed.</p> <p>Engage arborists and ecologists to undertake work.</p> <p>Prepare and submit the Annual Offset Area Report to the Australian Government; and inform the Australian Government of reportable incidents.</p>
<b>Qualified ecological consultant</b>	<p>Undertake initial and 5-year pest, weed and biomass survey to develop suitable pest management plan and grazing management plan</p> <p>Undertake 12 month and 2-year monitoring of recruitment in non-remnant Poplar box (RE 11.3.2) to ensure natural recruitment is occurring at a suitable density</p> <p>Undertake five-yearly monitoring of habitat quality within the offset area.</p>

### 9.4 Emergency contact procedure

A list of corrective actions and processes to be undertaken to address various management triggers are outlined in Table 9-1. In the event of a reportable incident, Vitrinite's Chief Operating Officer must contact DETSI within 10 business days of becoming aware of the incident. The following are considered reportable incidents:

- A failure to register the offset within 12 months of approval of the Offset Delivery Plan
- A force majeure event.
- Unapproved clearing within the offset area.
- A failure to achieve interim performance targets.
- A failure to submit an Annual Offset Report and/or an Offset Performance Report by the due date; and
- A failure to adhere to any other conditions of the Offset Delivery Plan or the *Environmental Offsets Act 2014* and *Queensland Environmental Offsets Policy [EPP/2015/1658]*

## 10 Legal obligations without offsets

Securing the offset area will increase protection for biodiversity values from clearing and provide management of grazing, fire, weeds and pest animals that are additional to current legal obligations.

The offset area is not protected from timber harvesting or the sowing of exotic pasture species by either the VM Act or the EPBC Act due to exemptions within the legislative frameworks for the continuing use of the land. Areas of remnant vegetation

are protected from broad scale clearing under the VM Act. However, clearing of areas mapped as Category X on the regulated vegetation map is permitted. Likewise, clearing of remnant vegetation for the purposes of timber harvesting, reducing hazardous fuel loads, or for maintaining/constructing fences and tracks is permitted under the VM Act. For an assessment of risk of loss without offsets, refer to Appendix A-1.

There are no pre-existing legislative requirements pertaining to fire management or grazing practices in the offset area, other than it being illegal to light fires during a local fire ban declared under the *Fire and Emergencies Act 1990* (Qld).

There are minimal pre-existing obligations for weed and pest management under the Biosecurity Act 2014 (Qld) and these relate only to species that are listed as prohibited or restricted under this act. All those who should reasonably and practically know have a general biosecurity obligation under section 23 of the Biosecurity Act 2014 to take all reasonable and practical measures to prevent or minimise the biosecurity risk. This obligation extends to preventing or minimising adverse effects of a declared weed or pest animal. Land holders must not do or omit to do something if the person knows or ought reasonably to know that doing or omitting to do the thing may exacerbate the adverse effects of a declared pest animal or weed.

In addition to these general biosecurity obligations, specific legal obligations pertain to certain restricted matters, depending on their classification under the *Biosecurity Act 2014* (**Table 10-1**). Rubber Vine and Parthenium are both category 3 restricted matters, which must not be intentionally spread, but landholders are under no legal obligation to control existing infestations.

Parthenium and Rubber Vine are both listed as Weeds of National Significance (WONS), though this listing does not incur any additional obligations.

**Table 10-1 Obligations under the Biosecurity Act 2014**

Category	What is required	Examples
1	Must report presence	Plant and animal diseases, feral ants
2	Must report presence	Noxious fish, certain weeds
3	Must not distribute, be traded or released into the environment	Most invasive weeds, pest animals, noxious fish
4	Must not move	All pest animals and noxious fish, certain weeds
5	Must not possess or keep	Wild dogs, rabbits, foxes, rabbits, certain noxious fish, certain weeds
6	Must not feed (except if undertaking a control program)	All pest animals, certain noxious fish
7	Must be killed and disposed of	Certain noxious fish

The obligations under the ODP for suppressing weed and pest animal numbers below densities prescribed in **Table 9-1** are additional to the above obligations under the *Biosecurity Act 2014*.

The Isaac Regional Council identifies the offset area as Rural Agricultural Land Class C in its planning scheme and offers no protection from the current ongoing land use. The Isaac Regional Council’s Biosecurity Plan 2024-27 outlines landholder responsibilities including requirements to discharge their general biosecurity obligations in line with their obligations under the Biosecurity Act 2014, and to exercise due diligence by taking all practical steps towards best practice management of pest species as defined under the Biosecurity Act 2014 and Isaac Regional Council local laws.

## 11 Legally binding mechanism

This offset will be secured via a voluntary declaration (VDec) as an area of high conservation value under the VM Act, or if required, such other method of securing a legally binding mechanism which meets the requirements of Queensland Legislation. Once this has been registered on the title, the offset area will be mapped as Category A regulated vegetation on the property map of assessable vegetation. An area mapped as Cat A on a PMAV is described as an “area subject to compliance notices, offsets and voluntary declarations”.

The approved ODP must be attached to the legal mechanism used to legally secure the environmental offset. The approval holder will notify the Department within 5 business days of the mechanism to legally secure the environmental offset having been executed. The VDec (or alternative mechanism referred to above) will remain in place as the legally securing mechanism for the offset area.

## 12 Monitoring and reporting

The monitoring program described in this section has two purposes:

- Assess performance of the offset against interim performance targets and completion criteria; and
- Quality assurance/quality control detailed as management measures are being undertaken in accordance with this report.

The former identifies whether the offset is successful, while the latter helps identify potential causes of any failure.

### 12.1 Monitoring methodology

The monitoring to be undertaken of the offset area is summarised in Table 12-1 and described in further detail in the following subsections.

**Table 12-1 Monitoring Schedule**

Attributes monitored	Timing	Responsibility
Pasture cover (biomass), condition of water points.	Weekly, Monthly	Land manager
Signage, condition of tracks, fences and fire breaks	Monthly	Vitrinite's Chief Operating Officer; land manager
11.3.2 rehabilitation areas	Annually for the first 2 years and as required in rehabilitation management plan.	Ecologists contracted by Vitrinite
Weed, pest and biomass monitoring	Annually or as required by management plan.	Ecologists contracted by Vitrinite
Feral animals, weeds (general)	Quarterly	Land manager, Ecologists contracted by Vitrinite.
Habitat quality scores / BioCondition (as required) for the MSES outlined in this report.	Mar-May in 2030, 2035, 2040 and 2045.	Ecologists contracted by Vitrinite
Baseline Monitoring	By end of year 1	Ecologists contracted by Vitrinite

#### 12.1.1 Schedule of proposed monitoring actions and reporting

The proposed monitoring schedule for the life of the offset is shown in **Table 12-2**.

**Table 12-2 Schedule of proposed monitoring actions**

Management actions monitored	Management zones	Timing	Method	Responsibility	Proposed reporting date	Relevant documentation
<b>Pasture cover (biomass)</b>	Sampling sites	Weekly, Monthly	Site inspections	Land manager	Annually within biomass monitoring management plan January 2025	Biomass monitoring management plan (required under the federal OAMP)
<b>Signage, condition of tracks, fences and fire breaks</b>	Whole site	Monthly	Site inspections	Vitrinite's Chief Operating Officer; land manager	monthly	N/A
<b>RE 11.3.2 rehabilitation/planting areas</b>	Zone A-1	Annually for the first 2 years and as required in the event a rehabilitation management plan.	As per Section 12.7	Ecologists contracted by Vitrinite	January 2025	Revegetation management plan
<b><i>C. cristata</i> (Glossy Black cockatoo) rehabilitation/planting areas</b>	Zone A-2	Annually for the first 2 years and as required in the event a rehabilitation management plan.	Site inspections to ensure trees are surviving and growing	Land manager, Ecologists contracted by Vitrinite	Annually in Offset Area Progress Report	Revegetation management plan
<b>Weed, pest and biomass monitoring</b>	Sampling sites	Annually or as required by management plan.	As per Sections 12.3, 12.4 and 12.5	Ecologists contracted by Vitrinite	January 2025	Weed management plan Pest management plan
<b>Feral animals, weeds (general)</b>	Whole site	Quarterly	As per Sections 12.3 and 12.5	Land manager, Ecologists contracted by Vitrinite.	Annually in Offset Area Progress Report	Pest management Plan
<b>Habitat quality scores / BioCondition (as required) for the MSES outlined in this ODP</b>	Sampling sites	Mar-May in 2030, 2035, 2040 and 2045.	As per <b>Section 12.10</b>	Ecologists contracted by Vitrinite	Within 3 months of sampling	N/A

## 12.2 Regular site inspection

The land manager is to undertake regular inspections of the offset area, which involve driving along the major tracks and fence lines. The following are to be checked and noted during these inspections:

- condition of entrance signs,
- any indications of unauthorised access (damaged locks, tyre tracks, used camp sites),
- direct observations or indirect signs (e.g., hoof prints around muddy dam edges) that cattle have intruded into the offset area during periods when they were to be excluded,



- signs of recent fire,
- condition of fire breaks,
- condition of and presence of water within all troughs and dams; and,
- Biomass monitoring condition of pasture (estimation of percentage cover of vegetation under 1 m tall, litter, rock and bare ground), as assessed against the Brigalow Belt pasture photo standards (<https://futurebeef.com.au/knowledge-centre/brigalow-belt-pasture-photo-standards>).

Inspections are to be undertaken at least monthly; however, during certain periods (e.g., when pasture condition indicates that cattle are soon to be removed, or when water levels in dams are low), more regular inspections (weekly) may be necessary.

Pest animals are to be monitored quarterly, by spending four daylight hours and four night-time hours searching for feral animals within the offset area. The numbers of each species observed are to be recorded for each round of monitoring, as a record of relative population size over time.

Weeds are to be monitored concurrently for signs of any infestations of restricted weeds not previously known to occur within the offset area.

Records are to be kept after each inspection, and all records are to be used to prepare an Annual Offset Area Report (Section 8).

### 12.3 Baseline weed surveys and management plan development

A baseline weed survey defining weed diversity and density for each Assessment Unit and targeting key vectors (waterways, access tracks, cattle holding yard) is to be completed including mapping of weed populations, density and location by a suitably qualified and experienced ecologist. The aim of this survey is to identify key weed populations that require management and provide data to allow assessment of control success and allow for identification of a new weeds introduced to the site.

A weed management plan is to be developed by a suitably qualified and experienced ecologist detailing:

- Monitoring methodology and locations
- Detail control methodologies for weed species
- Timing and schedule of weed control
- Monitoring requirements and schedule
- Key performance indicators including:
  - No new restricted weed species on site
  - Removal and control of all restricted weeds
  - Control / removal of all weed populations (excluding Buffel Grass) to less than 5% of baseline density
  - Control and removal of Buffel Grass in Poplar box (RE 11.3.2) areas
  - Reduction in presence of Buffel Grass across the property via grazing and fire.

### 12.4 Baseline biomass surveys and management plan

The baseline biomass survey has two key aims, namely:

- Assess fuel loads in areas of high fire risk to inform fire management
- Assess feed loads in grazing areas to inform grazing management

The baseline biomass surveys will be conducted by a suitably qualified and experienced ecologist / agronomist and must define biomass (via kg feed per hectare) in:

- each grazing paddock / management area

- mapped areas of high and medium fire risk
- vegetation mapped as containing Brigalow and Poplar box

A biomass management plan is to be developed by a suitably qualified and experienced ecologist / agronomist detailing:

- Monitoring methodology and locations
- Current biomass
- Timing and schedule of ongoing biomass monitoring
- Key performance indicators defining grazing and fire management requirements including:
  - Biomass maintained at suitable levels (between 1,500 and 2000 kg/hectare for grazing areas, below 1,500 kg of fuel load).

### 12.5 Baseline pest survey and management plan development

A baseline pest survey defining pest diversity and density for the site is to be completed including mapping of observations. The aim of this survey is to:

- identify pest species and populations that require management and
- provide data to allow assessment of control success and allow for identification of new weeds introduced to the site.

A pest management plan is to be developed by a suitably qualified and experienced ecologist detailing:

- Monitoring methodology and locations
- Detail control methodologies for pest species
- Timing, effort and schedule of pest control
- Monitoring requirements
- Key performance indicators including:
  - No new pest species on site
  - Removal and control of all restricted pests.

### 12.6 Biomass monitoring

Fuel loads and strategic grazing will be managed by an assessment of Biomass. No grazing is to occur within Brigalow/Casuarina vegetation or within areas regenerating from natural recruitment (Poplar and Brigalow/Casuarina habitat). The Biomass assessment will be undertaken:

- weekly in active grazing paddocks and prior to and at the completion of grazing by the land manager
- quarterly for fuel load assessment in high-risk fire areas by the land manager
- annually across the property by a suitably qualified person.

The monitoring events will be undertaken to:

- determining the current amount of feed present (kg/ha) using appropriate photo standards available on the Future Beef website (<https://futurebeef.com.au/resources/pasture-photo-standards>).
- identifying the amount of feed desired (kg/ha) at the end of the grazing event (minimum of 1,500 kg/ha)
- calculating the total useable feed (kg/ha) by subtracting the feed desired from the feed present.

- determining utilisation (i.e. the proportion of useable feed that livestock can use).
- determining the feed available for the grazing animal (kg/ha) by multiplying the total useable feed by the utilisation rate.
- calculating the safe stocking rate by:
  - determining the feed consumption per day (kg/day)
  - determining the number of days feed is required (days)
  - calculating the feed requirement per head (kg/ha) by multiplying the feed consumption per day by the number of days
  - calculating the stocking rate (kg/ha) by dividing the feed requirement per head by feed available
  - calculating the number of stock (head) by dividing the area of the paddock by the stocking rate

A report is to be completed annually by a suitably qualified and experienced person detailing the:

- results of the Biomass monitoring (weekly, quarterly and yearly)
- grazing regime for previous 12 months
- fire management activities for the previous 12 months
- assessment against KPI's
- recommendations for monitoring and management activities to be undertaken for the next 12 months.

### 12.7 Non-remnant 11.3.2 monitoring

The annual monitoring of disturbed and non-remnant vegetation of Poplar Box (AU 17 and 18) to be conducted for two years to ensure natural recruitment is occurring by a suitably qualified and experienced ecologist. Recruitment will be surveyed by the placement of a 100 m by 1 m transect and counting all woody plant species, detailed in the regional ecosystem description, overlapping (i.e. a portion of the individual is within) the transect. The transects will be undertaken at a rate of 1 transect per 5 hectares AU.

The results should meet at one individual per 8m<sup>2</sup> for Poplar box. Non-remnant areas of 11.3.2 are to be restored through natural regeneration. If recruitment is not naturally occurring within two years revegetation enhancement planting will be required by the development of a Revegetation Management Plan.

### 12.8 Glossy Black-cockatoo habitat monitoring

Areas deficient in Belah (*Casuarina cristata*) will be planted with tubestock. Survival rates are to be monitored by counting trees within 5 m of a 100 m transect, with the start and finish points permanently marked with stakes and recorded by GPS device. 1 transect per 10 ha of rehabilitation area will be required. Density of trees will be determined by AU and detailed in the revegetation management plan.

The number of trees initially planted will be recorded along the transects, and subsequent surveys will determine the survival rate. If less than 50% survive, the cause will be investigated and remedies sought.

### 12.9 Five yearly monitoring for Habitat quality

Detailed reassessments of habitat quality within the offset area are to be conducted every five years by suitably qualified and experienced ecologists. These are the principal means of assessing the offset against the interim performance targets and completion criteria listed in Section 5.

It is important that habitat quality is assessed using identical methodology throughout the duration of the offset, and it is equally important that this methodology aligns with that used to assess habitat quality at the impact site.

Habitat quality is to be monitored in the period March-May every five years after the approval of this report. Monitoring is to be undertaken by qualified ecologists or botanists with experience in ecosystems of the Brigalow Belt. Monitoring is to be undertaken at the same 88 sites used for the initial offset area assessment (**Table 12-3**).

In accordance with the Guide to determining terrestrial habitat quality version 1.3 (DES, 2020) two approaches for assessing site-based attributes are to be adopted:

- BioCondition scores; and
- Tailored, species-specific, fauna habitat quality scores.

Both approaches are used to assess different aspects of habitat quality for listed species. These approaches are described in the following subsections.

**Table 12-3 Location of Permanent Monitoring Points**

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
<b>Habitat Quality Sites -</b>						
AU01	Rem 11.10.1	57.34	HQ_BA03	-22.618128	148.297033	00
	Rem 11.10.1		HQ_BA04	-22.630462	148.317304	00
AU02	NR 11.10.12	77.87	HQ_BA24	-22.60585	148.28178	12
	NR 11.10.12		HQ_BA25	-22.605386	148.289315	85
	NR 11.10.12		Site034	-22.531713	148.27101	90
AU03	HVR 11.10.12	3.08	HQ_BA38	-22.60495	148.29363	215
AU04	NR 11.10.1x1	31.27	HQ_BA59	-22.54415	148.30366	245
	NR 11.10.1x1		HQ_BA60	-22.588325	148.301277	00
AU06	Rem11.10.1x1	2705.99	HQ_BA02	-22.656028	148.330828	00
			HQ_BA67	-22.611797	148.303065	00
	Rem11.10.1x1		HQ_BA68	-22.652408	148.3323	00
	Rem11.10.1x1		HQ_BA12	-22.568715	148.290397	00
	Rem11.10.1x1		Site009	-22.5206442	148.2778803	270
	Rem11.10.1x1		Site023	-22.5409976	148.2944682	180
AU07	NR 11.10.3	48.87	HQ_BA69	-22.629	148.34109	190
	NR 11.10.3		HQ_BA70	-22.620318	148.330463	00
AU08	HVR 11.10.3	28.5	HQ_BA71	-22.620443	148.334693	00
	HVR 11.10.3		HQ_BA72	-22.616372	148.328782	00
AU09	Rem 11.10.3	1263.87	HQ_BA73	-22.614945	148.294983	00
	Rem 11.10.3		Site004	-22.5245165	148.2961633	180
	Rem 11.10.3		HQ_BA74	-22.646355	148.339298	00
	Rem 11.10.3		Site010	-22.5201511	148.2957958	00
	Rem 11.10.3		Site017	-22.514261	148.276621	315
	Rem 11.10.3		Site027	-22.558104	148.275822	90

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
AU10	NR 11.10.7	259.55	HQ_BA05	-22.579993	148.306757	00
	NR 11.10.7		HQ_BA06	-22.54224	148.27498	00
	NR 11.10.7		HQ_BA07	-22.52827	148.29477	340
	NR 11.10.7		HQ_BA08	-22.519903	148.282048	00
AU11	HVR 11.10.7	9.76	Site011	-22.4929447	148.2749166	112.5
	HVR 11.10.7		Site012	-22.4915602	148.2749962	90
AU12	Rem 11.10.7	631	Site002	-22.51869	148.298868	270
	Rem 11.10.7		Site007	-22.5060988	148.2735522	45
	Rem 11.10.7		Site008	-22.5085357	148.2744246	90
	Rem 11.10.7		Site020	-22.502464	148.282128	00
	Rem 11.10.7		Site028	-22.5563502	148.2676348	00
	Rem 11.10.7		Site021	-22.5224852	148.293113	180
	Rem 11.10.7		Site031	-22.564384	148.282463	225
AU13	Dist. 11.10.7	12.79	HQ_BA10	-22.535018	148.279319	00
	Dist. 11.10.7		HQ_BA09	-22.532818	148.291763	00
AU14	Rem 11.10.8	33.36	HQ_BA11	-22.507787	148.27558	00
AU15	HVR 11.3.1	7.45	HQ_BA13	-22.60984	148.33919	260
	HVR 11.3.1		HQ_BA14	-22.6119	148.3358	330
AU16	Rem 11.3.1	28.43	HQ_BA15	-22.59936	148.31434	180
	Rem 11.3.1		Site022	-22.5251098	148.3018568	180
AU17	NR 11.3.2	212.56	HQ_BA16	-22.60341	148.32536	345
	NR 11.3.2		HQ_BA17	-22.607687	148.342488	00
	NR 11.3.2		HQ_BA18	-22.60426	148.281	260
	NR 11.3.2		HQ_BA19	-22.60773	148.313178	00
AU18	HVR 11.3.2	7.46	HQ_BA20	-22.608693	148.347242	00
	HVR 11.3.2		HQ_BA21	-22.612855	148.346802	00
AU19	Rem 11.3.2	91.99	HQ_BA22	-22.607475	148.3239	00
	Rem 11.3.2		HQ_BA23	-22.60857	148.335	345
AU20	Dist. 11.3.2	35.19	HQ_BA26	-22.60054	148.32025	170
	Dist. 11.3.2		HQ_BA27	-22.60189	148.31246	5
AU23	Rem 11.3.25	246.64	HQ_BA28	-22.60843	148.32836	90
	Rem 11.3.25		Site003	-22.52884	148.29875	247.5
	Rem 11.3.25		Site035	-22.5300975	148.2723313	90
	Rem 11.3.25		Site040	-22.5935261	148.2927553	00
AU24	Dist. 11.3.25	6.35	HQ_BA29	-22.61278	148.308722	00

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
AU25	NR 11.3.3	47.67	HQ_BA30	-22.614195	148.340612	00
	NR 11.3.3		HQ_BA31	-22.61083	148.33104	45
AU26	Rem 11.3.3	61.46	HQ_BA32	-22.60253	148.31746	180
	Rem 11.3.3		HQ_BA33	-22.599966	148.292282	185
	Rem 11.3.3		HQ_BA34	-22.599882	148.286358	00
AU27	Dist. 11.3.3	15.32	HQ_BA35	-22.60916	148.317723	00
AU29	Rem 11.3.39	20.98	HQ_BA36	-22.55736	148.34851	270
AU30	Dist. 11.3.39	11.2	HQ_BA39	-22.56617	148.32271	320
	Dist. 11.3.39		HQ_BA40	-22.56217	148.33138	50
AU31	NR 11.4.9	337.73	HQ_BA41	-22.54998	148.33971	165
	NR 11.4.9		HQ_BA42	-22.528393	148.330602	00
	NR 11.4.9		HQ_BA43	-22.569985	148.356025	00
	NR 11.4.9		Site039	-22.591667	148.301407	135
AU32	Rem 11.4.9	16.09	HQ_BA44	-22.528935	148.326265	00
	Rem 11.4.9		Site038	-22.590551	148.299995	00
AU33	Dist. 11.4.9	1.93	HQ_BA45	-22.527343	148.327108	0
AU34	NR 11.5.3	428.44	HQ_BA46	-22.518972	148.318017	0
	NR 11.5.3		HQ_BA47	-22.61944	148.34255	185
	NR 11.5.3		HQ_BA48	-22.61127	148.31801	175
	NR 11.5.3		Site041	-22.487619	148.289651	270
AU35	HVR 11.5.3	28.15	HQ_BA49	-22.517946	148.319307	00
	HVR 11.5.3		HQ_BA50	-22.521242	148.319892	00
AU36	Rem 11.5.3	68.29	HQ_BA01	-22.480698	148.287744	00
	Rem 11.5.3		HQ_BA51	-22.5402	148.31605	10
	Rem 11.5.3		HQ_BA52	-22.524545	148.305292	0
AOU38	NR 11.5.9b	1951.46	HQ_BA54	-22.62887	148.32514	15
	NR 11.5.9b		HQ_BA55	-22.63174	148.33895	190
	NR 11.5.9b		Site005	-22.5185909	148.3031427	180
	NR 11.5.9b		Site006	-22.4974319	148.2745272	90
	NR 11.5.9b		Site032	-22.528814	148.300845	180
	NR 11.5.9b		Site018	-22.4845177	148.2863699	180
AU39	HVR 11.5.9b	71.68	HQ_BA56	-22.513645	148.304202	00
AU40	Rem 11.5.9b	1465.76	Site013	-22.4876673	148.2760713	135
	Rem 11.5.9b		Site015	-22.4815213	148.2848786	270
	Rem 11.5.9b		Site016	-22.5169654	148.2881458	180

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
	Rem 11.5.9b		Site024	-22.5442136	148.2979784	00
	Rem 11.5.9b		Site025	-22.5463711	148.2973225	90
	Rem 11.5.9b		Site026	-22.562488	148.279491	00
	Rem 11.5.9b		Site029	-22.560484	148.267422	90
	Rem 11.5.9b		Site036	-22.5655928	148.3037166	157.5
	Rem 11.5.9b		Site037	-22.5751646	148.3006593	270
AU41	Dist. 11.5.9b	109.2	Site014	-22.4786676	148.2831044	45
	Dist. 11.5.9b		HQ_BA61	-22.53017	148.31861	180
	Dist. 11.5.9b		HQ_BA62	-22.56499	148.31964	250
	Dist. 11.5.9b		Site019	-22.4899562	148.281279	180
			HQ_BA37	-22.558672	148.339198	00
AU42	Rem 11.5.12a	153.86	HQ_BA63	-22.56914	148.339753	00
	Rem 11.5.12a		HQ_BA64	-22.572578	148.309663	00
	Rem 11.5.12a		HQ_BA65	-22.578528	148.298233	00
	Rem 11.5.12a		Site001	-22.499585	148.295286	135

## 12.10 BioCondition monitoring

BioCondition is assessed following the methodology prescribed by the *BioCondition Assessment Manual version 2.2* (DSITIA, 2015). It is expected that later versions of this manual will be published in the course of the offset; however, to maintain consistency it is important that the methodology of version 2.2 is adopted throughout the period of the offset.

BioCondition uses quadrat sampling to generate measurements of native plant richness, recruitment, shrub and tree cover, native perennial grass cover, litter cover, amount of coarse woody debris, non-native plant cover, tree height and number of large trees. These measurements are compared to benchmarks published by the Queensland Herbarium (Queensland Herbarium, 2022), which are compiled from data from reference sites. The benchmarks used in the initial assessment that informed the starting quality at the offset site should be applied throughout the duration of the offset, regardless of whether these are updated by the Queensland Herbarium as additional data is gathered over the 20-year offset period. These benchmarks are shown in **Table 12-4**.

The scoring system prescribed by the *BioCondition Assessment Manual version 2.2* (DSITIA, 2015) results in a score out of 80 for site-specific attributes, while the *Guide to determining terrestrial habitat quality version 1.3* (DES, 2020) requires that this score is out of 100. To achieve this conversion, the original score is multiplied by 1.25.



Table 12-4 BioCondition benchmarks (as published by the Queensland Herbarium) to be used to assess monitoring sites

Regional Ecosystem	Recruitment (%)	Non-native plant cover (%)	Tree species richness	Shrub species richness	Grass species richness	Forb species richness	Tree canopy height (m)	Tree subcanopy height (m)	Tree canopy cover (%)	Tree subcanopy cover (%)	Large tree threshold diameter (cm)		Number of large trees per ha		Shrub canopy cover (%)	Native perennial	Litter ground cover (%)	Woody debris length (m/ha)
											Eucalyptis	Non-eucalyptis	Eucalyptis	Non-eucalyptis				
11.10.1	100	0	4	4	9	17	24	13	30	15	46	30	11	3	13	16	50	388
11.10.12	100	0	4	6	15	15	16	7	23	2	43	na	18	na	13	34	17	200
11.10.3	100	0	3	4	7	9	15	na	41	na	41	26	6	36	3	23	32	498
11.10.7	100	0	6	6	7	9	18	7	40	17	44	25	15	8	8	20	53	387
11..9.4a (11.10.8)	100	0	19	17	3	13	13	7	30	33	na	25	na	146	24	3	60	1035
11.3.1	100	0	4	4	6	10	15	7	35	15	na	30	na	53	15	33	30	1520
11.3.2	100	0	2	2	9	15	18	9	37	7	44	na	18	na	4	26	35	281
11.3.25	100	0	4	4	8	13	23	11	34	12	53	26	19	13	7	35	21	473
11.3.3	100	0	3	5	12	15	18	10	28	5	45	na	10	na	4	45	30	285
11.3.39	100	0	3	3	10	16	19	12	35	11	43	24	15	6	1	49	23	247
11.4.9	100	0	2	5	5	10	10	6	25	11	na	28	na	47	5	16	45	980
11.5.3	100	0	6	6	6	10	16	na	20	na	44	34	9	1	3	19	20	314
11.5.9b	100	0	6	6	9	14	18	10	25	10	43	23	11	2	9	41	35	263
11.5.12a	100	0	6	4	6	8	16	7	30	20	40	25	8	14	5	21	32	533

## 12.11 Species habitat quality monitoring

In addition to BioCondition, which assesses the overall quality of the vegetation within the impact and offset sites, species-specific habitat attributes are also assessed at each sampling location. As prescribed by the *Guide to determining terrestrial habitat quality version 1.3* (DES, 2020), habitat attributes must include indicators for food availability, suitability for breeding and shelter, suitability for mobility and level of ongoing threats. These four habitat attributes are to have equal weighting when generating overall scores for habitat quality for any one species.

Based on a detailed literature reviewed undertaken within **Section 3.7**, a Project-specific set of indicators and a scoring system were devised in order to assess habitat quality for the Glossy Black Cockatoo. Some of the species-specific habitat attributes may overlap with the BioCondition assessment (e.g., number of large trees). The following attributes are additional assessments undertaken at monitoring locations:

- Basal area per hectare of Glossy Black Cockatoo food trees will be assessed via 360° sweeps with a Bitterlich gauge at the 0 m, 50 m and 100 m marks of the transect used to assess canopy cover for BioCondition. The mean of the three estimates will be used to represent the amount of food available at the site for Glossy Black Cockatoo.
- Elevated fine fuel hazard will be estimated based on the methodology and hazard classes described in the Overall fuel hazard assessment guide (Francis, Tolhurst, Wilson, & McCarthy, 2010). A summary of this classification system is provided in **Table 12-5** below. The elevated fine fuel hazard largely determines if a fire will spread to the forest canopy or be maintained at ground level, where it is of little threat to Glossy Black Cockatoo. Elevated fine fuel hazards that are high, very high or extreme have the potential to cause canopy fires.

**Table 12-5 Elevated fine fuel hazards**

Key attributes					Fuel hazard rating	Effect on fire behaviours (at FFDI 25)
Plant cover	% dead	Vertical continuity	Vegetation density	Thickness of fuel pieces		
<b>&lt;20% or low flammability species</b>	<20	-	Easy to walk in any direction without needing to choose a path between shrubs.	-	Low	Little or no effect.
<b>20-30%</b>	<20	Most of the fine fuel is at the top of the layer	Easy to choose a path through but brush against vegetation occasionally.	-	Moderate	Does not sustain flames readily.
<b>30-50%</b>	<20	Most of the fine fuel is at the top of the layer	Moderately easy to choose a path through, but brush against vegetation most of the time.	-	High	Causes some patchy increases in the flame height and/or rate of spread of fire.
<b>50-80%</b>	20-30	Continuous fine fuel from the bottom to the top layer	Need to carefully select a path through.	Mostly less than 1-2 mm thick.	Very high	Elevated fuels mostly dictate flame height and rate of spread of a fire.
<b>&gt;70%</b>	>30	Continuous fine fuel from the bottom to the top layer	Very difficult to select a path through. Need to push through vegetation.	Large amounts of fuel <2mm thick.	Extreme	Elevated fuels almost entirely determine the flame height and rate of spread of a fire.

## 13 Reporting

### 13.1 Annual offset area report

An Annual Offset Area Report is to be prepared and submitted every 12 months from the date of the approval of this ODP. The purpose of this Annual Offset Area Report is to describe the management actions undertaken during the year, and to document compliance with the EPBC Act approval. The Annual Offset Area Reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the ODP. To achieve this, all Annual Offset Area Reports must include the following contents:

- the Annual Pest Management Report
- the Annual Weed Management Report
- the Annual Biomass Monitoring report
- dates that cattle were introduced to, and removed from, the offset area, and the number of head involved,
- a description of any prescribed or uncontrolled fires that occurred within the offset area during the previous 12 months, including details about the date, location of the burn scar boundary, source of the fire, scorch height of the fire, and whether any trees taller than 4 m were killed as a result,
- the results of quarterly weed inspections and pest animal surveys
- the results of water point inspections and ground cover assessments
- the results of monthly biomass monitoring
- a description of all actions pertaining to weed control within the offset area during the previous 12 months, including the methods used, weeds targeted, and the timing, location and outcome of actions,
- a description of all actions pertaining to feral animal control within the offset area during the previous 12 months, including the methods used, pests targeted, and the timing, location and outcome of actions (e.g., number of animals killed),
- a description of any authorised and unauthorised clearing that took place within the offset area in the previous 12 months,
- a list of instances during the previous 12 months of cattle breaching the fencing surrounding the offset area, including those escaping from and intruding into the site, including the dates that fence repairs were undertaken; and
- a list of any reportable incidents that occurred during the previous 12 months.

In addition to the above, the first Annual Offset Area Report (to be submitted at the end of the first year) is to contain the following contents:

- the date that the offset area was registered with a voluntary declaration under the VM Act,
- the date that entrance signs were installed; and
- the baseline pest animal survey data.

Every five years, the years in which interim performance criteria are monitored, the Annual Offset Area Report is to be accompanied by an Offset Performance Report (**Section 13.2**).

The Annual Offset Area Report is to be prepared by a suitably qualified and experienced person; assigned by Vitrinite once provided with all relevant data and information from the land manager and associated sub-contractors. The Annual Offset Area Report is to be submitted by the approval holder to the QLD Government.

### 13.2 Offset performance report

The results of the five-yearly monitoring of habitat quality of the offset site are to be reported in an Offset Performance Report, which will accompany the Annual Offset Area Report for the year in which monitoring is undertaken.

Each Offset Performance Report is to contain the following:

- a description of the methodology used to assess habitat quality, and how these accords with the methodology prescribed in the ODP,
- a description of the timing of surveys and of recent weather conditions affecting plant growth,
- all raw data gathered at each monitoring site,
- a calculation of habitat quality scores for Glossy Black Cockatoo, RE 11.3.2 and Vegetation Management Watercourse Res across the offset area,
- an assessment of how the habitat quality scores accord with the interim performance targets listed in **Table 6-1**
- an assessment of the size and location of Rubber Vine infestations within the offset area,
- an indication of whether any additional risks/threats over and above those outlined in the final approved ODP are apparent and management actions to be employed to manage those risks,
- if any triggers were detected and, if so, the corrective actions that were implemented and their outcomes; and
- recommendations for improving/updating the ODP/ offset management approach in accordance with adaptive management.

The final Offset Performance Report, due 20 years after the approval of the ODP, is to assess whether the entire offset has fully achieved and maintained all offset completion criteria listed in **Section 6** of this ODP.

Offset Performance Reports are to be prepared by suitably qualified ecologists.

### 13.3 Reporting schedule

The reporting requirements and associated schedule is provided in **Table 13-1**

**Table 13-1 Schedule of proposed reporting**

Report to DETSI	Reporting period	Submission due date
<b>Annual Offset Area Report</b>	1 November to 31 October each year	30 November each year
<b>Offset Performance Report (an appendix to the Annual Offset Area Report)</b>	1 March to 31 May in 2030, 2035, 2040 and 2045	30 November 2030, 2035, 2040 and 2045

## 14 Failure to achieve performance triggers

In the event that an Offset Performance Report reveals a failure of the offset to achieve the relevant interim performance triggers and completion criteria listed in Section 0, the following response is triggered:

Step 1: Investigate cause of failure:

- within one month after detecting the failure, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved in the specified timeframes.
- within two months after detecting the failure, complete a re-evaluation of the suitability of relevant management measures in the ODP. This re-evaluation must identify appropriate corrective actions. Corrective actions may include, but are not limited to:

- a third-party review of the ODP to provide input into the effectiveness of the management actions,
- increasing the frequency, intensity or methods used for pest animal and weed control; or,
- modifying the grazing schedule or Ecological burns to modify understorey structural attributes.

Step 2: Revise this OAMP to incorporate changes to management measures identified under Step 1 and submit this revised plan to DCCEEW for approval.

Step 3: Implementation of corrective action(s):

- the appropriate corrective actions identified under Step 1 will be implemented as soon as practicable, and in any case within six months after detection of the trigger.

## **15 Revision of this Offset Development Plan**

The ODP is to be revised in the following situations:

- In the event of any failures to achieve interim performance triggers.
- Following force majeure events.
- In the event that offset habitat scores far exceed interim performance triggers to the extent that some management measures are superfluous to the objective of meeting interim performance triggers and offset completion criteria.

Revisions are to be undertaken in consultation with DETSI, and the revised ODP is to be approved by the administering authority prior to implementation.

## **16 Suitably Qualified Assessors**

The field assessment and habitat quality assessment for the impact and offset sites were conducted by qualified, licenced and experienced ecologists from Biodiversity Australia Pty Ltd and METServe.

## Part B Habitat Quality Assessment

Habitat quality assessments are required under the Queensland Offsets Policy and the Projects methodology for assessing this is based on the Queensland Guide to Determining Terrestrial Habitat Quality version 1.3, which specifies a combination of BioCondition assessments, and tailored, species-specific habitat quality scores based on the suitability of the site for foraging, breeding, sheltering, dispersal and protection from threats

### 17 Habitat quality methodology

The methodology adopted when undertaking habitat quality assessments with regard to environmental offsets in Queensland is prescribed by the Guide to Determining Terrestrial Habitat Quality version 1.3 (DES, 2020).

This guideline proposes two methodologies for assessing habitat quality:

- BioCondition assessments conducted in accordance with the BioCondition Assessment Manual version 2.2 (DSITIA, 2015); and
- Specially tailored, species-specific habitat quality scores developed by considering the foraging, breeding, sheltering and dispersal requirements for the Glossy Black Cockatoo, along with local threat levels.

The former provides a general assessment of the overall state of the vegetation community. BioCondition assesses both site-specific habitat quality attributes, as well as landscape-scale attributes such as connectivity, size of habitat patch and regional context. The site-specific component of BioCondition is broadly analogous to the “site condition” score suggested within How to Use the Offset Assessment Guide. The landscape-scale component is broadly analogous to “site context” score.

The offset site and Impact site were sampled during the dry season, to ensure comparability in seasonal state. Field surveys of the impact site were undertaken from 1st June to 31st August 2023 and field surveys of the candidate offset site from 15th to 22nd July 2024, and the 27th of October 2024.

The BioCondition methodology (Neldner, et al., 2020) is the accepted standard approach to assess quality of REs, such as 11.3.2 and Vegetation Management Watercourse REs. The methodology for Glossy Black cockatoo habitat quality was conducted through some aspects of BioCondition and additional bespoke habitat quality methodologies as described in Section 17.2.

#### 17.1 Sampling design

The impact and offset sites were assessed using identical methodologies and sampling designs. The sampling design framework was designed according to the Guide to Determining Terrestrial Habitat Quality version 1.3 (DES, 2020). This framework defines a ‘matter area’ for each prescribed environmental matter requiring offsets as the area that contains or represents the extent of an individual prescribed environmental matter.

Matter areas were defined as areas currently pertaining to the matters of interest or areas which the matters could utilise following the incorporation of management measures. For example, for the Glossy Black-Cockatoo, the matter areas included REs where *Casuarina* and *Allocasuarina* species are currently found or locations (such as patches of non-remnant Brigalow) where *Casuarina cristata* in particular could be planted and therefore utilised by the Glossy Black-cockatoo in the future. For the RE 11.3.2, the matter area pertains to the location of this RE (non-remnant and remnant). The matter area for the vegetation management watercourse REs are the portions of the areas already under management for EPBC offsets (Squatter Pigeon, Koala, Greater Glider) that are included within the defined distance of the defining bank of a mapped watercourse.

Matter areas were then divided into Assessment Units (AU). An AU is a defined area or group of areas of at least 1 ha in total size within the matter area that is relatively homogenous generally containing only one Regional Ecosystem (RE) type that is of a reasonably consistent broad condition state (i.e., remnant, non-remnant, high-value regrowth (HVR) and disturbed).

The AUs assigned to the impact and offset sites were based upon field-verified RE mapping undertaken as part of the Terrestrial Ecological Assessment (METServe, 2024). Vegetation mapping was assessed following the methodology described by Neldner et al. (Neldner, et al., 2020).

Each assessment unit was surveyed at multiple sampling sites. The number of sampling sites per assessment unit is based on the density suggested by the *Guide to determining terrestrial habitat quality version 1.3* (**Table 17-1**). 19 assessment units are contained within the Vulcan South impact site, requiring 51 sampling sites (**Table 17-2** and **Figure 17-2**). Sampling sites were selected at random prior to arriving at the sites, in order to avoid biases in their placement and ensure that they were representative of their respective assessment unit.

**Table 17-1 Recommended number of sampling sites per assessment unit**

Assessment unit size	Number of sampling sites
1-50 ha	At least two
50-100 ha	Three
100-500 ha	Four
500-1,000 ha	Five
More than 1,000 ha	Six



### 17.1.1 Impact site

19 assessment units are contained within the Vulcan South impact site, requiring 51 sampling sites (Table 17-2 and Figure 17-1).

**Table 17-2 AU's within the Impact site**

Assessment Unit	Description	Area (ha)	Number of sampling locations
AU01	Remnant 11.3.2 – <i>Eucalyptus populnea</i> woodland on alluvial plains	5.22	2
AU02	Remnant 11.3.7 – <i>Corymbia</i> spp. open woodland on alluvial plains	3.83	2
AU03	Remnant 11.3.25 – <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	7.56	2
AU04	Remnant 11.4.8 – <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	66.94	4
AU05	Remnant 11.4.9 – <i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	0.22	1
AU06	Remnant 11.5.3 – <i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	7.08	2
AU07	Remnant 11.5.9 – <i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains and/or remnant surfaces	211.97	5
AU08	Remnant 11.9.2 – <i>Eucalyptus melanophloia</i> +/- <i>E. orgadophila</i> woodland to open woodland on fine-grained sedimentary rocks	163.98	4
AU09	Remnant 11.10.1 – <i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks	41.42	2
AU10	Remnant 11.10.1x1 – Variation of <i>Corymbia citriodora</i> woodland on coarse-grained sedimentary rocks. This variation includes <i>Eucalyptus crebra</i> , <i>Corymbia clarksoniana</i> , <i>Eucalyptus melanophloia</i> and <i>Acacia burdekinsis</i> in varying proportions in the emergent and/or canopy layers.	69.27	3
AU11	Remnant 11.10.3 – <i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	163.74	4
AU12	Remnant 11.10.7 - <i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	28.23	2
AU13	Non-Remnant 11.10.3 – <i>Acacia shirleyi</i> or <i>A. catenulata</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	36.87	2
AU14	Non-Remnant 11.10.7 – <i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	8.00	2
AU15	Non-Remnant 11.4.8 – <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	102.42	1
AU16	Non-Remnant 11.5.3 – <i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	284.38	2
AU17	Non-Remnant 11.5.9 – <i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains and/or remnant surfaces	44.28	1
AU18	Non-Remnant 11.3.6 – <i>Eucalyptus melanophloia</i> woodland on alluvial plains	6.44	0
AU19	Non-Remnant 11.3.7 – <i>Corymbia</i> spp. open woodland on alluvial plains	0.29	1
AU20	Non-Remnant 11.3.25 – <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	1.49	0
AU21	Non-Remnant 11.5.9a – <i>Eucalyptus melanophloia</i> woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges. Soils are generally deep red earths. Not a Wetland.	0.91	0
AU22	Non-Remnant 11.9.2 – <i>Eucalyptus melanophloia</i> +/- <i>E. orgadophila</i> woodland to open woodland on fine-grained sedimentary rocks	194.61	2
AU23	Non-Remnant 11.4.9 – <i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	14.43	0
AU24	Non-Remnant 11.3.2 – <i>Eucalyptus populnea</i> woodland on alluvial plains	12.87	0
	<b>Total</b>	<b>1476.4</b>	

**Table 17-3 Sampling sites within the Impact area**

Sampling site	Assessment unit	Assessment unit detailed	GDA94 coordinates (easting)	GDA94 coordinates (northing)	Compass bearing
I01	11.10.1	11.10.1x1	-22.2912	148.1772	315
I02	11.10.7	11.10.7	-22.2785	148.143	270
I03	11.10.1	11.10.1x1	-22.2816	148.1418	135
I04	11.10.3	11.10.3	-22.2864	148.1389	0
I05	11.10.1	11.10.1	-22.2858	148.1488	270
I06	11.10.3	11.10.3	-22.2838	148.1512	270
I07	11.10.1	11.10.1	-22.2912	148.1627	135
I08	11.10.3	11.10.3	-22.2901	148.1687	0
I09	11.10.7	11.10.7	-22.3049	148.1818	180
I10	11.10.3	11.10.3	-22.301	148.1838	45
I11	11.3.7	NR 11.3.7	-22.2988	148.1895	135
I12	11.3.7	11.3.7	-22.3069	148.1946	270
I13	11.10.7	NR 11.10.7	-22.3104	148.1949	0
I14	11.10.7	NR 11.10.7	-22.3087	148.1948	0
I15	11.5.9	NR 11.5.9	-22.3145	148.1962	0
I16	11.5.9	11.5.9	-22.318	148.1981	0
I17	11.5.9	11.5.9a	-22.3186	148.1981	180
I18	11.3.25	11.3.25	-22.3215	148.2004	225
I19	11.3.7	11.3.7	-22.3226	148.2005	180
I20	11.5.9	11.5.9	-22.3258	148.2038	180
I21	11.10.1	11.10.1x1	-22.3287	148.2059	180
I22	11.5.9	11.5.9	-22.3351	148.2205	315
I23	11.4.8	11.4.8	-22.34	148.2281	NA
I24	11.5.9	11.5.9	-22.3468	148.2274	0
I25	11.4.8	11.4.8	-22.3433	148.2216	315
I26	11.4.8	11.4.8	-22.3479	148.2332	90
I27	11.9.2	11.9.2	-22.3523	148.2373	270
I28	11.5.3	11.5.3	-22.3505	148.2246	225
I29	11.4.8	11.4.8	-22.3521	148.2225	90
I30	11.9.2	11.9.2	-22.3511	148.2202	0
I31	11.5.3	11.5.3	-22.3471	148.2186	90
I32	11.9.2	NR 11.9.2	-22.3556	148.2333	90
I33	11.9.2	11.9.2	-22.358	148.2268	270
I34	11.9.2	11.9.2	-22.3649	148.2229	180
I35	11.5.9	11.5.9	-22.3602	148.2183	180
I36	11.9.2	NR 11.9.2	-22.361	148.2354	90
I37	11.4.9	11.4.9	-22.3663	148.2342	315
I38	11.3.2	11.3.2	-22.3671	148.2369	270
I39	11.9.2	NR 11.9.2	-22.3605	148.2406	180

I40	11.9.2	NR 11.9.2	-22.3625	148.2439	270
I41	11.4.8	NR 11.4.8	-22.3658	148.2465	180
I42	11.4.8	NR 11.4.8	-22.3692	148.2495	180
I43	11.5.3	NR 11.5.3	-22.3722	148.2545	90
I43	11.5.3	NR 11.5.3	-22.3722	148.2545	90
I45	11.4.8	NR 11.4.8	-22.3787	148.2567	315
I46	11.4.8	NR 11.4.8	-22.3735	148.2479	0
I47	11.3.2	11.3.2	-22.3672	148.242	45
I48	11.3.25	11.3.25	-22.3856	148.2644	90
I49	11.5.3	NR 11.5.3	-22.3867	148.2612	90
I50	11.5.3	NR 11.5.3	-22.3881	148.2625	180
I51	11.10.3	NR 11.10.3	-22.394	148.2654	135
I52	11.5.3	NR 11.5.3	-22.3978	148.2642	0
I53	11.10.3	NR 11.10.3	-22.402	148.2672	90
I54	11.5.9	NR 11.5.9	-22.3991	148.2682	315
I55	11.5.3	NR 11.5.3	-22.3981	148.2704	180

Source: Appendix B

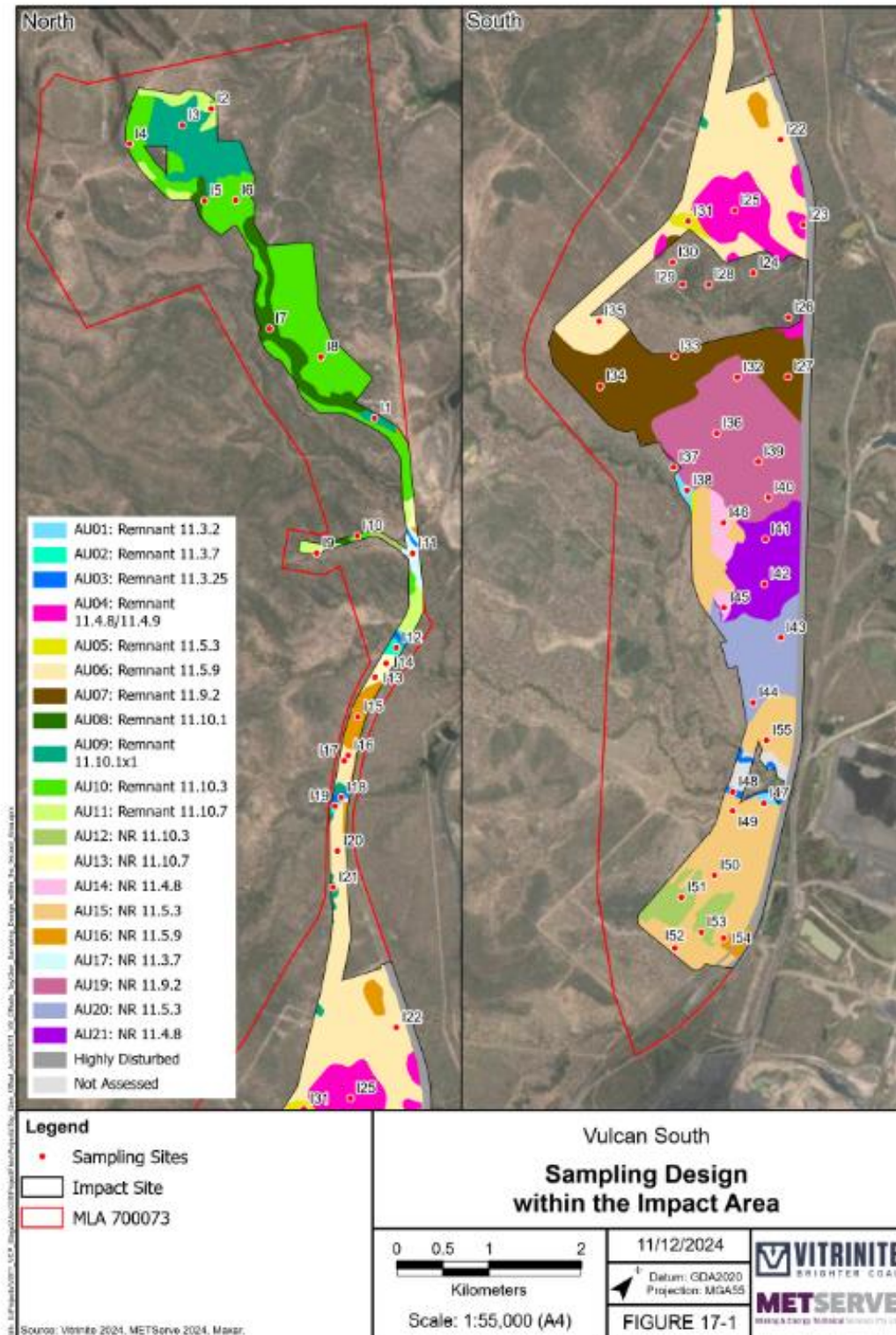


Figure 17-1 Sampling design within the Impact area

### 17.1.2 Offset site

The offset site and associated sampling locations are shown in **Table 17-4** and **Figure 17-2**. The number of sampling locations was based on the sizes of each AU's.

For the BioCondition and Habitat Quality assessment, a total of 88 sites plots were distributed across 42 AU's within the chosen offset site based on their RE and their level of disturbance. The AU's for the Impact Site (**Table 17-3**) are numbered differently to the AU's for the Offset site. Benchmarks are specific to each regional ecosystem (RE) or vegetation community in Queensland (**Table 12-4**). However, some REs are still missing benchmarks on the Queensland Herbarium (2023) BioCondition Benchmark Database. Version 3.4 (April 2023). The AU 14 on the offset site, for example, (RE 11.10.8 - Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks) has no benchmarks described by the Queensland Herbarium (2023) BioCondition Benchmark Database. In this case, the benchmark used for the offset site was 11.9.4a - Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks), suggested to be the closest vegetation similarities for RE 11.10.8.

**Table 17-4 Sampling locations within the offset site**

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
<b>Habitat Quality Sites -</b>						
AU01	Rem 11.10.1	57.34	HQ_BA03	-22.618128	148.297033	00
	Rem 11.10.1		HQ_BA04	-22.630462	148.317304	00
AU02	NR 11.10.12	77.87	HQ_BA24	-22.60585	148.28178	12
	NR 11.10.12		HQ_BA25	-22.605386	148.289315	85
	NR 11.10.12		Site034	-22.531713	148.27101	90
AU03	HVR 11.10.12	3.08	HQ_BA38	-22.60495	148.29363	215
AU04	NR 11.10.1x1	31.27	HQ_BA59	-22.54415	148.30366	245
	NR 11.10.1x1		HQ_BA60	-22.588325	148.301277	00
AU06	Rem11.10.1x1	2705.99	HQ_BA67	-22.611797	148.303065	00
	Rem11.10.1x1		HQ_BA68	-22.652408	148.3323	00
	Rem11.10.1x1		HQ_BA12	-22.568715	148.290397	00
	Rem11.10.1x1		Site009	-22.5206442	148.2778803	270
	Rem11.10.1x1		Site023	-22.5409976	148.2944682	180
	Rem11.10.1x1		Site030	-22.544554	148.300669	90
	11.10x1		HQ_BA02	-22.656028	148.330828	00
AU07	NR 11.10.3	48.87	HQ_BA69	-22.629	148.34109	190
	NR 11.10.3		HQ_BA70	-22.620318	148.330463	00
AU08	HVR 11.10.3	28.5	HQ_BA71	-22.620443	148.334693	00
	HVR 11.10.3		HQ_BA72	-22.616372	148.328782	00
AU09	Rem 11.10.3	1263.87	HQ_BA73	-22.614945	148.294983	00
	Rem 11.10.3		Site004	-22.5245165	148.2961633	180
	Rem 11.10.3		HQ_BA74	-22.646355	148.339298	00
	Rem 11.10.3		Site010	-22.5201511	148.2957958	00
	Rem 11.10.3		Site017	-22.514261	148.276621	315
	Rem 11.10.3		Site027	-22.558104	148.275822	90
AU10	NR 11.10.7	259.55	HQ_BA05	-22.579993	148.306757	00
	NR 11.10.7		HQ_BA06	-22.54224	148.27498	00
	NR 11.10.7		HQ_BA07	-22.52827	148.29477	340

Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
	NR 11.10.7		HQ_BA08	-22.519903	148.282048	00
AU11	HVR 11.10.7	9.76	Site011	-22.4929447	148.2749166	112.5
	HVR 11.10.7		Site012	-22.4915602	148.2749962	90
AU12	Rem 11.10.7	631	Site002	-22.51869	148.298868	270
	Rem 11.10.7		Site007	-22.5060988	148.2735522	45
	Rem 11.10.7		Site008	-22.5085357	148.2744246	90
	Rem 11.10.7		Site020	-22.502464	148.282128	00
	Rem 11.10.7		Site028	-22.5563502	148.2676348	00
	Rem 11.10.7		Site021	-22.5224852	148.293113	180
	Rem 11.10.7		Site031	-22.564384	148.282463	225
AU13	Dist. 11.10.7	12.79	HQ_BA10	-22.535018	148.279319	00
	Dist. 11.10.7		HQ_BA09	-22.532818	148.291763	00
AU14	Rem 11.10.8	33.36	HQ_BA11	-22.507787	148.27558	00
AU15	HVR 11.3.1	7.45	HQ_BA13	-22.60984	148.33919	260
	HVR 11.3.1		HQ_BA14	-22.6119	148.3358	330
AU16	Rem 11.3.1	28.43	HQ_BA15	-22.59936	148.31434	180
	Rem 11.3.1		Site022	-22.5251098	148.3018568	180
AU17	NR 11.3.2		HQ_BA16	-22.60341	148.32536	345
	NR 11.3.2		HQ_BA17	-22.607687	148.342488	00
	NR 11.3.2		HQ_BA18	-22.60426	148.281	260
	NR 11.3.2		HQ_BA19	-22.60773	148.313178	00
AU18	HVR 11.3.2	7.46	HQ_BA20	-22.608693	148.347242	00
	HVR 11.3.2		HQ_BA21	-22.612855	148.346802	00
AU19	Rem 11.3.2	91.99	HQ_BA22	-22.607475	148.3239	00
	Rem 11.3.2		HQ_BA23	-22.60857	148.335	345
AU20	Dist. 11.3.2	35.19	HQ_BA26	-22.60054	148.32025	170
	Dist. 11.3.2		HQ_BA27	-22.60189	148.31246	5
AU23	Rem 11.3.25	246.64	HQ_BA28	-22.60843	148.32836	90
	Rem 11.3.25		Site003	-22.52884	148.29875	247.5
	Rem 11.3.25		Site035	-22.5300975	148.2723313	90
	Rem 11.3.25		Site040	-22.5935261	148.2927553	00
AU24	Dist. 11.3.25	6.35	HQ_BA29	-22.61278	148.308722	00
AU25	NR 11.3.3	47.67	HQ_BA30	-22.614195	148.340612	00
	NR 11.3.3		HQ_BA31	-22.61083	148.33104	45
AU26	Rem 11.3.3	61.46	HQ_BA32	-22.60253	148.31746	180
	Rem 11.3.3		HQ_BA33	-22.599966	148.292282	185
	Rem 11.3.3		HQ_BA34	-22.599882	148.286358	00
AU27	Dist. 11.3.3	15.32	HQ_BA35	-22.60916	148.317723	00
AU29	Rem 11.3.39	20.98	HQ_BA36	-22.55736	148.34851	270
AU30	Dist. 11.3.39	11.2	HQ_BA39	-22.56617	148.32271	320
	Dist. 11.3.39		HQ_BA40	-22.56217	148.33138	50
AU31	NR 11.4.9	337.73	HQ_BA41	-22.54998	148.33971	165



Assessment Unit	Description	Size within offset area (ha)	Site No.	Location of Transect Start Point		
				Latitude	Longitude	Bearing
	NR 11.4.9		HQ_BA42	-22.528393	148.330602	00
	NR 11.4.9		HQ_BA43	-22.569985	148.356025	00
	NR 11.4.9		Site039	-22.591667	148.301407	135
AU32	Rem 11.4.9	16.09	HQ_BA44	-22.528935	148.326265	00
	Rem 11.4.9		Site038	-22.590551	148.299995	00
AU33	Dist. 11.4.9	1.93	HQ_BA45	-22.527343	148.327108	0
AU34	NR 11.5.3	428.44	HQ_BA46	-22.518972	148.318017	0
	NR 11.5.3		HQ_BA47	-22.61944	148.34255	185
	NR 11.5.3		HQ_BA48	-22.61127	148.31801	175
	NR 11.5.3		Site041	-22.487619	148.289651	270
AU35	HVR 11.5.3	28.15	HQ_BA49	-22.517946	148.319307	00
	HVR 11.5.3		HQ_BA50	-22.521242	148.319892	00
AU36	Rem 11.5.3	68.29	HQ_BA01	-22.480698	148.287744	00
	Rem 11.5.3		HQ_BA51	-22.5402	148.31605	10
	Rem 11.5.3		HQ_BA52	-22.524545	148.305292	0
A0U38	NR 11.5.9b	1951.46	HQ_BA54	-22.62887	148.32514	15
	NR 11.5.9b		HQ_BA55	-22.63174	148.33895	190
	NR 11.5.9b		Site005	-22.5185909	148.3031427	180
	NR 11.5.9b		Site006	-22.4974319	148.2745272	90
	NR 11.5.9b		Site032	-22.528814	148.300845	180
	NR 11.5.9b		Site018	-22.4845177	148.2863699	180
AU39	HVR 11.5.9b	71.68	HQ_BA56	-22.513645	148.304202	00
AU40	Rem 11.5.9b	1465.76	Site013	-22.4876673	148.2760713	135
	Rem 11.5.9b		Site015	-22.4815213	148.2848786	270
	Rem 11.5.9b		Site016	-22.5169654	148.2881458	180
	Rem 11.5.9b		Site024	-22.5442136	148.2979784	00
	Rem 11.5.9b		Site025	-22.5463711	148.2973225	90
	Rem 11.5.9b		Site026	-22.562488	148.279491	00
	Rem 11.5.9b		Site029	-22.560484	148.267422	90
	Rem 11.5.9b		Site036	-22.5655928	148.3037166	157.5
	Rem 11.5.9b		Site037	-22.5751646	148.3006593	270
AU41	Dist. 11.5.9b	109.2	Site014	-22.4786676	148.2831044	45
	Dist. 11.5.9b		HQ_BA61	-22.53017	148.31861	180
	Dist. 11.5.9b		HQ_BA62	-22.56499	148.31964	250
	Dist. 11.5.9b		Site019	-22.4899562	148.281279	180
	Dist. 11.5.9.b		HQ_BA37	-22.558672	148.339198	00
AU42	Rem 11.5.12a	153.86	HQ_BA63	-22.56914	148.339753	00
	Rem 11.5.12a		HQ_BA64	-22.572578	148.309663	00
	Rem 11.5.12a		HQ_BA65	-22.578528	148.298233	00
	Rem 11.5.12a		Site001	-22.499585	148.295286	135
			Total: 88 sites			



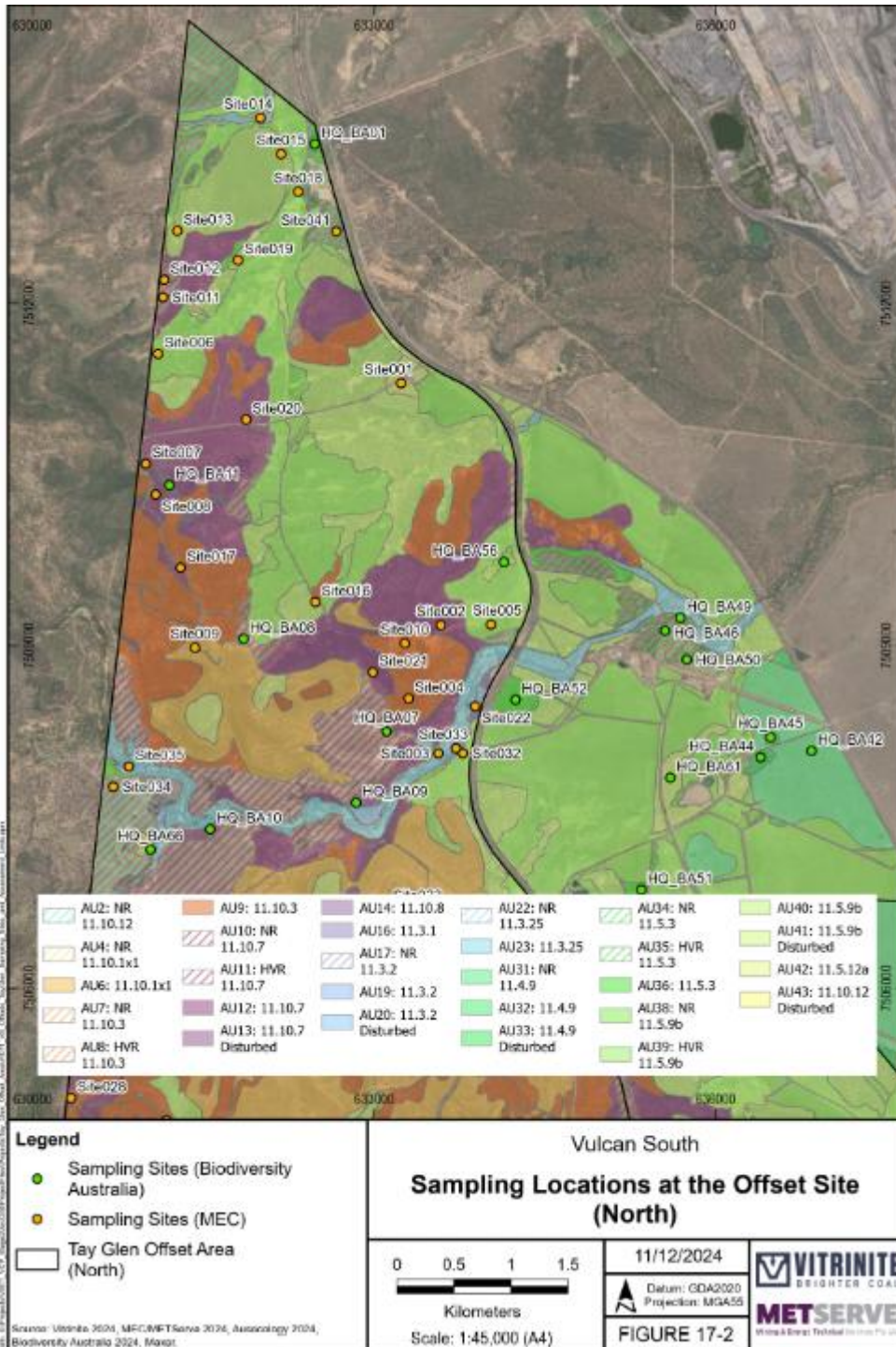


Figure 17-2 Sampling locations at the Offset site location (north)

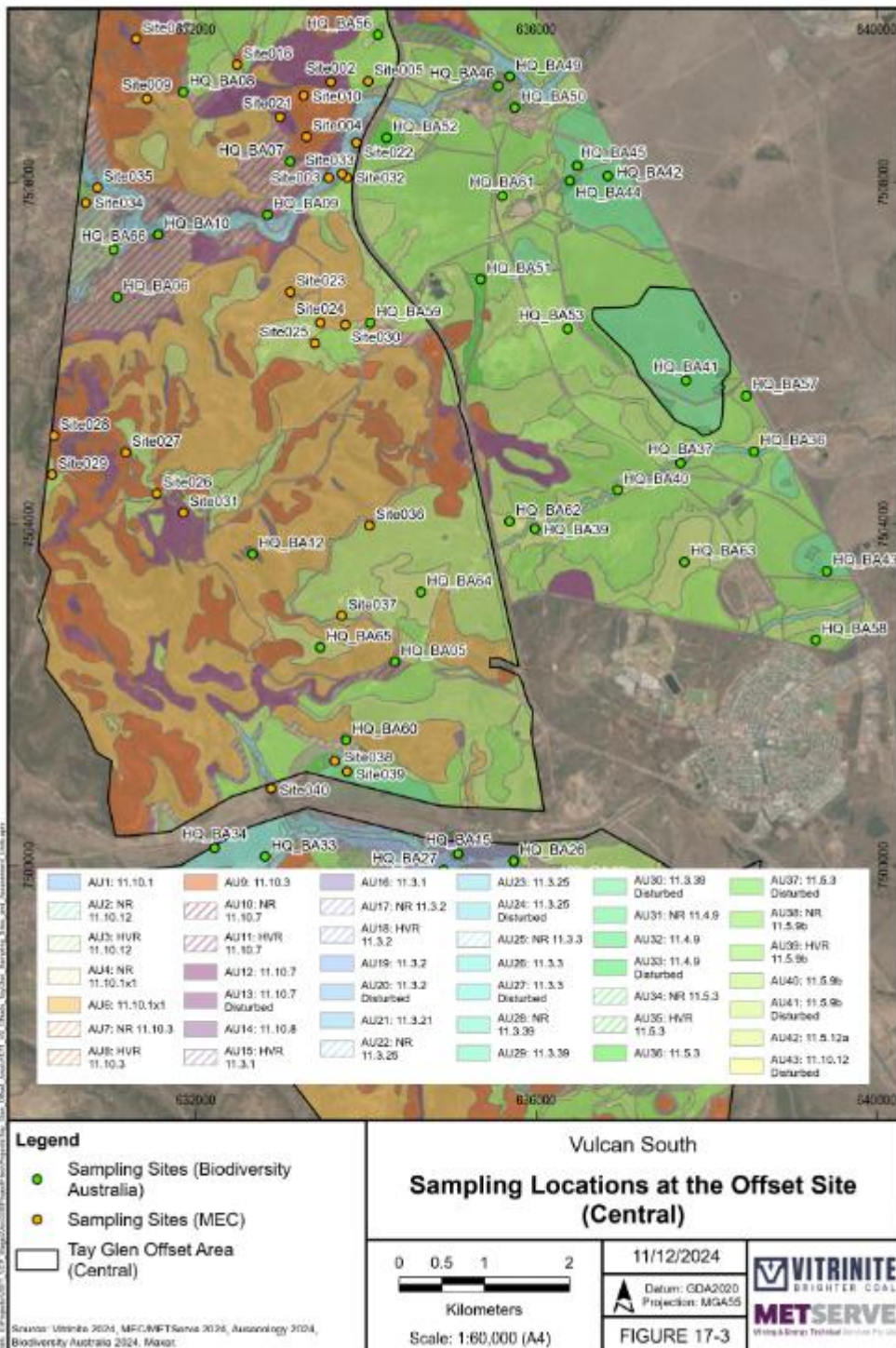


Figure 17-3 Sampling locations at the offset site (central)



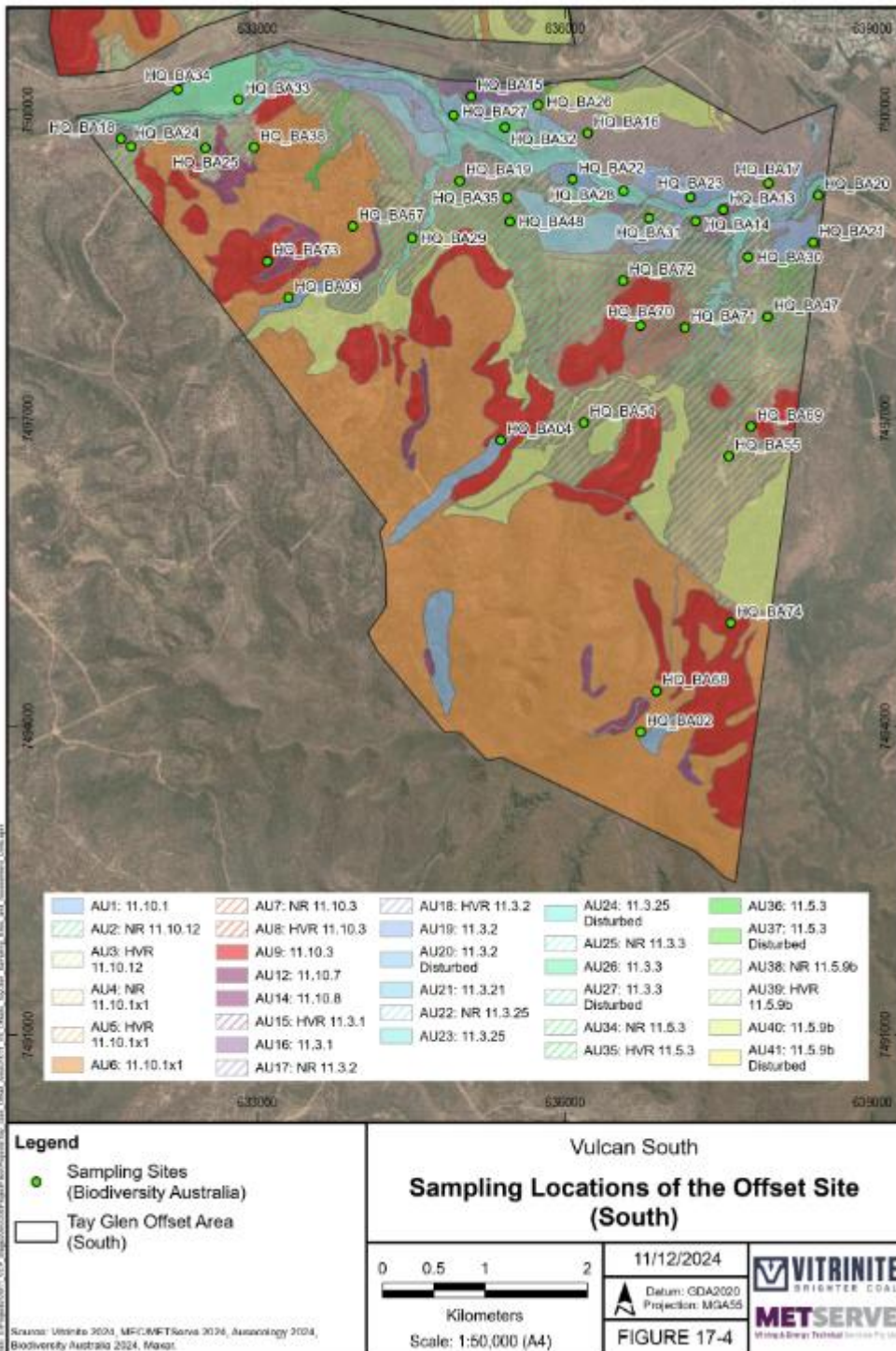


Figure 17-4 Sampling locations at the offset site (south)

### 17.1.2.1 Targeted fauna surveys

While no explicit targeted fauna surveys were completed for the Glossy Black Cockatoo, while completing BioCondition and Habitat Quality assessments passive incidental searches were completed, during which foraging and nesting resources were identified (where present). 18 days of habitat quality/BioCondition surveys were completed (10 days with 2 ecologists and 9 days with 4 ecologists) totalling to 560 hours of surveying. An additional 8 survey days over the entire property to map Regional Ecosystems was completed prior to this, which totalled 160 working hours. No Glossy Black Cockatoos were found during this time.

## 17.2 Habitat quality assessment

Habitat quality assessments were conducted at each sampling location of the impact site and offset site following the methodology described in *Guide to assessing terrestrial habitat quality QLD for the BioCondition* and the *Guide to determining terrestrial habitat quality in QLD*.

In summary, a 100 m × 50 m assessment area was installed at each sampling location to assess floristic and structural attributes. Riparian vegetation units (e.g., RE 11.3.25) were an exception; due to the narrow, linear nature of these habitats. On riparian vegetation sites, where the standard 100 m x 50 m, assessment area was not able to be placed without extending outside the AU, the assessment area was modified to a 200 m x 25 m area if possible or in more difficult cases either a 100 m x 25 m area or a 50 m x 25 m area; with the largest dimensions possible preferentially selected. The attributes of each location were then used to calculate separate habitat quality scores for each protected matter for which the AU forms part of its matter area. A weighted average habitat quality score was then calculated for the entire matter area within the offset site, by weighting the mean scores for each AU by the size of each unit. The raw data and the habitat quality scores are presented in Section 5, to provide baseline data against which future improvements can be assessed.

Refer to the *Guide to assessing terrestrial habitat quality QLD for the BioCondition* method used to determine the habitat quality scoring for the Vegetation Management watercourse REs and the RE 11.3.2.

Refer to **Table 17-5** below for the habitat scoring methodology for the Glossy Black Cockatoo.

In addition to BioCondition, which assesses the overall quality of the vegetation within the impact and offset sites, species-specific habitat attributes will also be assessed at each sampling location. As prescribed by the *Guide to determining terrestrial habitat quality version 1.3* (Department of Environment and Science, 2020), habitat attributes must include indicators for food availability, suitability for breeding and shelter, suitability for mobility and level of ongoing threats. These four habitat attributes are to have equal weighting when generating overall scores for habitat quality for any one species.

**Table 17-5: Habitat scoring for the Glossy Black-cockatoo**

Quality and availability of food and habitat required for foraging	Basal area of all food trees (B)	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<1 m <sup>2</sup> /ha		>1 – 2 m <sup>2</sup> /ha	>2 – 10 m <sup>2</sup> /ha	>10 – 20 m <sup>2</sup> /ha	>20 m <sup>2</sup> /ha
	Percentage of primary food trees to total (P)	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	0-20%	>20-40%	>40-60%	>60-80%	>80%	
The final score is determined by multiplying the above values (B x P)						
Quality and availability of habitat required for shelter and breeding	Probability of hollows of a suitable size (>15 cm entrance diameter) per hectare (double the number recorded per half hectare BioCondition transect).	<b>0</b>	<b>4</b>	<b>6</b>	<b>10</b>	<b>15</b>
		None: No eucalypt trees >50cm DBH	Poor: 1 to 4 eucalypt trees >50cm DBH	Moderate: 5 to 11 eucalypt trees >50cm DBH	High: 12 to 20 eucalypt trees >50cm DBH	Very High: >20 eucalypt trees >50cm DBH
		<b>0</b>	<b>5</b>	<b>10</b>	<b>18</b>	<b>25</b>

<b>Quality and availability of habitat required for mobility</b>	Probability of foraging habitat within 14 km.	No suitable REs within 14 km	<10% of habitat in 14 km radius contains suitable REs	>10 to 40% of habitat in 14 km radius contains suitable REs	>40 to 60% of habitat in 14 km radius contains suitable REs	>60% of habitat in 14 km radius contains suitable REs			
<b>Absence of threats</b>	Threat of intense canopy fires						<b>Position in landscape</b>		
							Valley	Midslope	Crest
		<b>Elevated fine fuel hazard (see Table 12-5)</b>	Low	25	22	18			
			Moderate	18	13	9			
High to extreme	14	7	1						

## 18 Habitat quality of the Impact site

BioCondition scores ranged from 15.6/100 to 83.8/100 across sampling locations at the Impact Site. Most of the variation in score was caused by variation in non-native plant cover, which was poorly correlated to whether the vegetation unit was remnant or previously cleared. Consequently, the average BioCondition of remnant locations (59.4/100) was not substantially different from regrowth (48.4/100) or non-remnant (37.6/100) areas. The average BioCondition score of the entire impact site, weighted by the relative size of each AU, was 53/100.

The Table below represents the BioCondition score for each sampling location within the impact site

**Table 18-1 BioCondition scores for the Impact site**

Unit	Site	Regional Ecosystem	Species Richness				Tree height	Ground cover (%)			Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Foliage cover		SUM	Score
			Trees	Shrubs	Grasses	Forbs		Native perennial grass	Organic litter	Trees					Shrub			
<b>Maximum score</b>			5	5	5	5	5	5	5	5	15	5	10	5	5	80	100	
AU10	I01	Remnant 11.10.1x1	5	5	5	5	5	1	5	3	0	5	0	5	3	47	58.8	
AU12	I02	Remnant 11.10.7	5	5	5	5	3	1	5	5	5	2	0	2	5	48	60.0	
AU10	I03	Remnant 11.10.1x1	5	5	5	2.5	3	3	5	3	0	5	0	2	0	38.5	48.1	
AU11	I04	Remnant 11.10.3	5	5	5	5	5	3	5	5	5	5	3	5	5	61	76.3	
AU09	I05	Remnant 11.10.1	5	5	5	2.5	3	3	5	5	10	5	5	5	0	58.5	73.1	
AU11	I06	Remnant 11.10.3	5	5	5	5	3	1	3	5	5	5	5	5	3	55	68.8	
AU09	I07	Remnant 11.10.1	5	5	2.5	2.5	3	3	5	5	15	2	10	5	3	66	82.5	

AU1 1	I08	Remnant 11.10.3	5	5	5	5	3	1	3	5	0	5	5	5	3	50	62.5
AU1 2	I09	Remnant 11.10.7	2.5	2.5	2.5	2.5	5	0	5	3	0	5	0	2	3	33	41.3
AU1 1	I10	Remnant 11.10.3	5	5	5	5	5	1	3	5	0	5	10	5	3	57	71.3
AU1 8	I11	Non-Remnant 11.3.7	5	5	2.5	5	5	0	5	5	5	5	0	5	5	50.5	63.1
AU0 2	I12	Remnant 11.3.7	5	5	2.5	5	5	1	3	3	5	5	0	5	5	49.5	61.9
AU1 4	I13	Non-Remnant 11.10.7	5	5	2.5	5	3	1	5	5	5	5	0	0	5	46.5	58.1
AU1 4	I14	Non-Remnant 11.10.7	5	2.5	5	5	3	0	5	5	0	2	0	2	3	37.5	46.9
AU1 7	I15	Non-Remnant 11.5.9	5	5	5	5	3	5	5	3	5	5	10	2	3	61	76.3
AU0 7	I16	Remnant 11.5.9	5	2.5	5	5	3	1	3	3	15	5	5	0	0	52.5	65.6
AU2 1	I17	Remnant 11.5.9a	5	2.5	5	5	5	1	3	5	10	5	5	5	5	61.5	76.9
AU0 3	I18	Remnant 11.3.25	5	5	2.5	2.5	5	0	3	5	15	5	0	5	5	58	72.5
AU0 2	I19	Remnant 11.3.7	5	5	5	5	3	0	3	5	5	2	0	5	5	48	60.0
AU0 7	I20	Remnant 11.5.9	5	5	2.5	2.5	3	5	2	5	0	2	0	5	3	44.5	55.6
AU1 0	I21	Remnant 11.10.1x1	5	5	5	5	5	5	3	5	5	5	10	5	3	40	50.0
AU0 7	I22	Remnant 11.5.9	5	5	5	5	5	1	5	5	5	2	10	2	3	66	82.5
AU0 4	I23	Remnant 11.4.8	5	5	5	5	3	1	3	5	5	5	5	2	5	58	72.5
AU0 7	I24	Remnant 11.5.9	5	2.5	5	5	3	1	5	3	5	5	5	5	3	54	67.5
AU0 4	I25	Remnant 11.4.8	5	2.5	5	5	3	1	5	5	0	5	10	5	3	52.5	65.6
AU0 4	I26	Remnant 11.4.8	5	5	2.5	5	3	0	5	5	0	0	0	0	5	54.5	68.1
AU0 8	I27	Remnant 11.9.2	5	5	5	5	5	1	3	5	10	5	10	5	3	35.5	44.4
AU0 6	I28	Remnant 11.5.3	5	2.5	5	5	5	1	5	5	5	5	10	2	3	67	83.8
AU0 4	I29	Remnant 11.4.8	5	2.5	5	5	5	0	5	5	0	2	0	2	5	58.5	73.1
AU0 8	I30	Remnant 11.9.2	5	5	5	2.5	3	5	3	5	0	5	10	5	5	41.5	51.9
AU0 6	I31	Remnant 11.5.3	5	2.5	0	5	3	0	2	5	0	2	0	0	5	58.5	73.1
AU2 6	I32	Non-remnant 11.9.2	5	2.5	2.5	5	3	0	2	5	0	5	0	2	3	29.5	36.9
AU0 8	I33	Remnant 11.9.2	5	2.5	2.5	5	3	0	2	3	5	5	0	2	3	35	43.8

AU0 8	I34	Remnant 11.9.2	5	2.5	5	5	3	1	5	5	5	2	0	5	3	38	47.5
AU0 7	I35	Remnant 11.5.9	5	2.5	0	5	5	0	2	3	0	0	0	0	0	46.5	58.1
AU2 6	I36	Non-remnant 11.9.2	5	5	2.5	2.5	5	1	5	5	5	2	0	5	3	22.5	28.1
AU0 5	I37	Remnant 11.4.9	5	5	2.5	2.5	3	1	2	5	5	5	3	2	5	46	57.5
AU0 1	I38	Remnant 11.3.2	5	5	2.5	5	0	0	5	5	0	5	0	2	5	46	57.5
AU2 6	I39	Non-remnant 11.9.2	2.5	2.5	0	2.5	0	0	2	3	0	0	0	0	0	39.5	49.4
AU1 5	I40	Non-remnant 11.4.8	2.5	2.5	2.5	5	0	0	2	0	0	0	0	0	5	12.5	15.6
AU1 5	I41	Non-remnant 11.4.8	2.5	2.5	0	5	0	0	2	3	0	0	0	0	3	19.5	24.4
AU1 5	I42	Non-remnant 11.4.8	5	5	5	5	3	0	3	5	0	2	0	3	3	18	22.5
AU1 6	I43	Non-remnant 11.5.3	2.5	2.5	2.5	5	3	0	5	5	0	2	0	0	0	39	48.8
AU1 6	I44	Non-remnant 11.5.3	5	5	2.5	5	3	0	5	5	10	2	0	5	3	27.5	34.4
AU1 5	I45	Non-Remnant 11.4.8	5	5	0	2.5	5	0	2	0	0	0	0	0	3	50.5	63.1
AU1 5	I46	Non-remnant 11.4.8	5	2.5	0	2.5	3	0	5	0	0	0	0	0	3	21	26.3
AU0 1	I47	Remnant 11.3.2	5	2.5	0	0	5	0	3	5	15	2	0	5	0	48.5	60.6
AU0 3	I48	Remnant 11.3.25	2.5	2.5	0	2.5	3	0	3	3	10	0	0	2	0	42.5	53.1
AU1 6	I49	Non-Remnant 11.5.3	2.5	2.5	5	2.5	3	0	3	5	0	0	0	5	5	28.5	35.6
AU1 6	I50	Non-Remnant 11.5.3	5	0	5	2.5	3	1	3	5	5	5	10	5	3	33.5	41.9
AU1 3	I51	Non-Remnant 11.10.3	2.5	0	2.5	2.5	3	3	5	5	5	0	0	5	0	52.5	65.6
AU1 6	I52	Non-Remnant 11.5.3	5	5	2.5	2.5	3	0	3	5	0	2	10	5	0	33.5	41.9
AU1 3	I53	Non-Remnant 11.10.3	5	2.5	5	5	3	1	3	3	0	0	3	5	3	43	53.8
AU1 7	I54	Non-Remnant 11.5.9	2.5	5	5	5	3	0	5	5	0	5	0	2	3	38.5	48.1
AU1 6	I55	Non-Remnant 11.5.3	5	5	5	5	5	1	5	3	0	5	0	5	3	40.5	50.6

## 19 Habitat quality of the Offset site

BioCondition scores at the offset site ranged between 4.38/100 (non-remnant 11.4.9) and 81.25/100 (remnant 11.10.3) (**Table 19-1** and **Table 19-2**). Most variation among sites is related to the number of large trees, weed cover and native perennial grass cover. The Candidate Offset Site consistently scored low for Canopy Species Recruitment. This is generally a result of cattle grazing. Additionally canopy cover for the site and shrub cover were also consistently low.

The average BioCondition score across the offset site, weighted by the relative size of each AU, was 49.58/100. The impact site, however, had a weighted BioCondition average of 52.51/100.

REs were combined due to similarities in floristics and BVGs. These include 11.5.9 being combined with 11.9.5b, and 11.10.7 being combined with 11.10.3.

Applying the same scoring approach to the impact and offset sites for each protected matter (see Section 3) results in weighted average scores for the matters shown below in **Table 19-1**.

**Table 19-1 Scores for matters in the impact and offset sites**

Matter	Size of impact area (ha)	Size of offset area (ha)	Scores for Impact site	Scores for Offset Site (Pre-management)	Scores for Offset site (post management)	Difference (nearest integer out of 10)	% offset	Impact sampling sites	Offset Sampling sites
<b>Glossy Black-cockatoo</b>	36.3	241.55	42.5	34.1/100	49.01/100	2/10	665%	I23, I25 and I26	HQ_BA13, HQ_BA14, HQ_BA15, HQ_BA41, HQ_BA44, Site022, Site038, Site039
<b>Watercourse REs</b>									
<b>11.3.25</b>	1.44	175.16	58.3	59.6 (6/10)	84.6 (8/10)	3/10	12,152%	I18 I48	HQ_BA28, HQ_BA29, Site003, Site035, Site040
<b>11.5.9 and 11.5.9b</b>	10.25	152.14	62.5	57.7(6/10)	83.6 (8/10)	3/10	1,484%	I15, I16, I17, I20, I22, I24, I35, I54	HQ_BA54, HQ_BA55, HQ_BA56, HQ_BA61, HQ_BA62, Site005, Site006, Site013, Site014, Site015



Matter	Size of impact area (ha)	Size of offset area (ha)	Scores for Impact site	Scores for Offset Site (Pre-management)	Scores for Offset site (post management)	Difference (nearest integer out of 10)	% offset	Impact sampling sites	Offset Sampling sites
									Site016 Site019 Site024 Site025 Site026 Site029 Site032 Site036 Site037
<b>11.10.3</b>	3.44	26.55	73.4	75.4 (8/10)	79.8 (8/10)	4/10	771.8 %	I04 I06 I08 I10 I51 I53	HQ_BA69 HQ_BA70 HQ_BA71 HQ_BA72 HQ_BA73 HQ_BA74 Site004 Site010 Site017 Site027
<b>11.10.7 and 11.10.1</b>	2.46	39.66	61.7 and 51.8, respectively	59.5 (6/10)	65.1 (7/10)	6/10	1,612 %	I01 I03 I05 I07 I21 I02 I09 I13 I14	HQ_BA02 HQ_BA03 HQ_BA04 HQ_BA12 HQ_BA59 HQ_BA60 HQ_BA67 HQ_BA68 Site009 Site023 Site030 HQ_BA05 HQ_BA06 HQ_BA07 HQ_BA08 HQ_BA09

Matter	Size of impact area (ha)	Size of offset area (ha)	Scores for Impact site	Scores for Offset Site (Pre-management)	Scores for Offset site (post management)	Difference (nearest integer out of 10)	% offset	Impact sampling sites	Offset Sampling sites
									HQ_BA10 Site002 Site007 Site008 Site011 Site012 Site020 Site021 Site028 Site031
<b>Watercourse total</b>	<b>20.5<sub>1</sub></b>	<b>393.92</b>	<b>67.85</b>	<b>59.90 (6/10)</b>	<b>81.9 (8/10)</b>	<b>2/10</b>	<b>1,921 %</b>		
<b>Of Concern REs</b>									
<b>11.3.2</b>	3.3	64.51 (including 41.17 in watercourse areas)	66.1/100	53 (5/10)	66 (7/10)	2/10	1,954 %	138 147	HQ_BA16 HQ_BA17 HQ_BA18 HQ_BA19 HQ_BA20 HQ_BA21 HQ_BA22 HQ_BA23 HQ_BA26 HQ_BA27 Site033

Table note: 13.3 ha of Watercourse portions of 11.3.2 are treated separately under the 11.3.2 specific management areas, which include watercourse areas that suitably offset the impact

The habitat quality of each of the sampling sites were averaged to inform the quality of each assessment unit, the assessment units which apply to the matter area were then used to directly determine the total quality of the matter area.

Table 19-2 BioCondition scores for the offset site

Unit	Site	Regional Ecosystem	Species Richness				Ground cover (%)						Foliage cover		SUM	Score	
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees			Shrub
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU36	HQ_BA01	11.5.3	5	5	2.5	2.5	5	0	0	3	5	2	0	3	3	36	45.00
AU6	HQ_BA02	11.10.1x1	5	5	2.5	2.	3	5	0	5	5	2	100	5	3	55	68.75
AU1	HQ_BA03	11.10.1	5	5	0	2.5	5	1	0	5	5	2	0	5	5	47.5	59.38
AU1	HQ_BA04	11.10.1	5	5	2.5	2.5	4	1	0	3	5	5	10	5	3	51	63.75
AU10	HQ_BA05	NR 11.10.7	2.5	2.5	2.5	0	0	3	0	5	0	5	3	0	3	23.5	29.38
AU10	HQ_BA06	NR 11.10.7	0	0	2.5	0	0	3	5	0	0	5	5	0	0	18.5	23.13
AU10	HQ_BA07	NR 11.10.7	0	0	2.5	0	0	5	3	0	0	5	0	0	0	18.5	23.13
AU10	HQ_BA08	NR 11.10.7	0	2.5	2.5	2.5	0	5	0	0	0	5	3	0	3	20.5	25.63
AU13	HQ_BA09	11.10.7 Disturbed	2.5	2.5	0	0	2.5	0	3	3	5	0	3	2.5	3	27	33.75
AU13	HQ_BA10	11.10.7 Disturbed	5	2.5	0	0	5	5	5	3	0	0	0	2	3	35	43.75
AU14	HQ_BA11	11.10.8	0	2.5	5	0	3	5	5	0	5	5	5	5	5	44.2	55.21
AU6	HQ_BA12	11.10.1x1	5	5	2.5	2.5	3	0	3	5	5	5	5	5	5	51	63.75
AU15	HQ_BA13	HVR 11.3.1	2.5	5	0	0	5	1	3	3	5	0	3	2	5	32.5	40.63
AU15	HQ_BA14	HVR 11.3.1	5	2.5	0	0	4	2	5	3	5	0	3	5	3	37.5	46.88
AU16	HQ_BA15	11.3.1	5	5	0	2.5	5	1	5	5	10	2	5	4	3	52.5	65.63
AU17	HQ_BA16	NR 11.3.2	0	0	0	0	0	0	5	0	0	2	5	0	0	12	15.00
AU17	HQ_BA17	NR 11.3.2	5	5	0	0	0	0	5	5	0	2	0	0	5	27	33.75
AU17	HQ_BA18	NR 11.3.2	2.5	2.5	0	0	3	5	3	0	0	0	5	1	5	27	33.75
AU17	HQ_BA19	NR 11.3.2	2.5	5	0	0	0	5	0	5	0	0	5	0	3	25.5	31.88

Unit	Site	Regional Ecosystem	Species Richness					Ground cover (%)						Foliage cover		SUM	Score
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees	Shrub		
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU18	HQ_BA20	HVR 11.3.2	5	5	0	0	3	1	0	5	5	2	0	2	5	33	41.25
AU18	HQ_BA21	HVR 11.3.2	5	5	0	0	0	0	0	5	0	5	0	0	3	24	30.00
AU19	HQ_BA22	11.3.2	5	5	2.5	0	4	0	3	5	5	2	5	2	3	41.5	51.88
AU19	HQ_BA23	11.3.2	5	5	2.5	0	3	1	3	5	5	5	5	2	3	44.5	55.63
AU2	HQ_BA24	NR 11.10.12	2.5	5	0	0	1.5	5	5	3	0	5	5	0	5	37	46.25
AU2	HQ_BA25	NR 11.10.12	2.5	2.5	2.5	0	1.5	5	5	5	0	2	5	2	0	33	41.25
AU20	HQ_BA26	11.3.2 Disturbed	5	0	2.5	0	5	5	5	3	5	0	5	5	0	40.5	50.63
AU20	HQ_BA27	11.3.2 Disturbed	5	5	2.5	0	5	5	5	3	5	0	0	5	3	48.5	60.63
AU23	HQ_BA28	11.3.25	5	5	2.5	0	5	1	5	3	10	5	3	5	3	52.5	65.63
AU24	HQ_BA29	11.3.25 Disturbed	5	5	2.5	0	4	3	5	3	5	2	3	5	3	45.5	56.88
AU25	HQ_BA30	NR 11.3.3	2.5	5	0	0	0	5	0	5	0	2	5	0	3	27.5	34.38
AU25	HQ_BA31	NR 11.3.3	5	2.5	0	0	3	5	3	3	5	2	5	3.5	3	40	50.00
AU26	HQ_BA32	11.3.3	5	5	2.5	0	4	1	5	3	5	5	5	2.5	3	46	57.50
AU26	HQ_BA33	11.3.3	2.5	2.5	0	0	3	5	3	3	0	0	5	2	5	31	38.75
AU26	HQ_BA34	11.3.3	5	2.5	0	0	2.5	0	5	0	5	2	3	1.5	5	31.5	39.38
AU27	HQ_BA35	11.3.3 Disturbed	5	5	0	0	0	0	0	5	0	5	10	0	3	33	41.25
AU29	HQ_BA36	11.3.39	5	5	0	0	4	0	5	3	5	2	0	4	3	36	45.00
AU41	HQ_BA37	11.5.9b Disturbed	5	5	0	2.5	4	1	0	3	5	5	0	4	5	39.5	49.38

Unit	Site	Regional Ecosystem	Species Richness					Ground cover (%)						Foliage cover		SUM	Score
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees	Shrub		
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU3	HQ_BA38	HVR 11.10.12	5	2.5	0	0	3	5	5	5	0	5	5	2.5	5	43	53.75
AU30	HQ_BA39	11.3.39 Disturbed	5	2.5	0	0	4	0	5	3	5	2	0	4	3	33.5	41.88
AU30	HQ_BA40	11.3.39 Disturbed	5	5	2.5	2.5	4	1	5	5	5	5	0	2.5	3	45.5	56.88
AU31	HQ_BA41	NR 11.4.9	0	5	2.5	0	0	5	3	0	0	0	5	0	3	23.5	29.38
AU31	HQ_BA42	NR 11.4.9	0	5	0	0	0	0	0	0	0	0	0	0	3	8	10.00
AU31	HQ_BA43	NR 11.4.9	0	2.5	0	0	0	1	0	0	0	0	0	0	0	3.5	4.38
AU32	HQ_BA44	11.4.9	5	5	0	0	5	0	5	5	10	5	0	4	3	47	58.75
AU33	HQ_BA45	11.4.9 Disturbed	5	5	0	2.5	5	0	3	5	5	2	0	5	3	40.5	50.63
AU34	HQ_BA46	NR 11.5.3	2.5	2.5	0	2.5	3	0	0	5	5	5	0	2	0	27.5	34.38
AU34	HQ_BA47	NR 11.5.3	0	0	2.5	0	3	5	3	0	0	2	5	0	0	20.5	25.63
AU34	HQ_BA48	NR 11.5.3	2.5	2.5	0	0	0	3	3	3	5	2	0	0	3	24	30.00
AU35	HQ_BA49	HVR 11.5.3	5	2.5	0	2.5	5	0	0	5	5	2	0	5	5	37	46.25
AU35	HQ_BA50	HVR 11.5.3	5	5	0	0	3	0	0	5	5	0	3	2	3	31	38.75
AU36	HQ_BA51	11.5.3	5	5	2.5	2.5	5	1	5	3	5	2	3	5	3	47	58.75
AU36	HQ_BA52	11.5.3	2.5	2.5	2.5	2.5	5	5	5	5	5	5	3	2	3	48	60.00
AU38	HQ_BA54	NR 11.5.9b	2.5	2.5	2.5	0	0	5	3	5	0	2	5	0	3	30.5	38.13
AU38	HQ_BA55	NR 11.5.9b	0	0	2.5	0	0	5	5	0	0	0	5	0	0	17.5	21.88
AU39	HQ_BA56	HVR 11.5.9b	2.5	2.5	0	0	3	0	3	5	5	2	10	1	3	37	46.25
AU4	HQ_BA59	NR 11.10.1x1	2.5	5	0	0	1.5	5	3	3	5	5	5	1	5	36	45.00
AU4	HQ_BA60	NR 11.10.1x1	5	2.5	2.5	0	0	1	5	5	0	2	10	0	0	33	41.25

Unit	Site	Regional Ecosystem	Species Richness					Ground cover (%)						Foliage cover		SUM	Score
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees	Shrub		
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU41	HQ_BA61	11.5.9b Disturbed	2.5	2.5	2.5	0	4	5	3	3	5	5	5	2.5	3	43	53.75
AU41	HQ_BA62	11.5.9b Disturbed	5	5	2.5	0	5	1	5	3	5	2	0	5	3	41.5	51.88
AU42	HQ_BA63	11.5.12a	2.5	2.5	2.5	2.5	1.5	0	5	5	5	2	3	25	3	37	46.25
AU42	HQ_BA64	11.5.12a	2.5	5	2.5	2.5	3	0	5	5	5	2	0	2.5	5	40	50.00
AU42	HQ_BA65	11.5.12a	5	5	2.5	2.5	3	5	5	5	5	0	10	4	3	55	68.75
AU43	HQ_BA66	11.10.12	5	2.5	0	0	5	0	5	3	5	2	0	4	5	36.5	45.63
AU6	HQ_BA67	11.10.1x1	5	5	0	2.5	3	1	5	5	5	2	3	4	0	40.5	50.63
AU6	HQ_BA68	11.10.1x1	5	5	2.5	2.5	3	3	3	5	5	5	3	2.5	0	44.5	55.63
AU7	HQ_BA69	NR 11.10.3	2.5	2.5	5	0	0	5	5	5	0	5	5	0	5	40	50.00
AU7	HQ_BA70	NR 11.10.3	0	5	2.5	0	0	5	3	5	0	0	5	0	0	25.5	31.88
AU8	HQ_BA71	HVR 11.10.3	0	5	2.5	2.5	0	0	5	0	0	5	5	0	5	32.5	40.63
AU8	HQ_BA72	HVR 11.10.3	2.5	5	2.5	2.5	0	5	5	5	0	5	5	0	3	38	47.50
AU9	HQ_BA73	11.10.3	5	2.5	2.5	2.5	5	0	5	5	10	2	10	5	3	57.5	71.88
AU9	HQ_BA74	11.10.3	5	5	2.5	2.5	5	3	5	5	10	2	10	5	3	63	78.75
AU42	Site001	11.5.12a	5	5	5	2.5	4	0	5	5	5	2	0	2.5	3	44	55.00
AU12	Site002	11.10.7	5	5	5	5	5	3	5	5	10	5	3	5	3	64	80.00
AU23	Site003	11.3.25	5	5	2.5	2.5	5	0	5	5	10	5	0	3.5	3	51.5	64.38
AU9	Site004	11.10.3	5	2.5	2.5	5	3	5	5	5	10	5	10	5	3	66	82.50
AU38	Site005	NR 11.5.9b	2.5	2.5	2.5	2.5	0	3	3	5	0	5	3	0	5	34	42.50
AU38	Site006	NR 11.5.9b	2.5	5	2.5	2.5	0	5	0	5	0	2	0	0	0	24.5	30.63

Unit	Site	Regional Ecosystem	Species Richness					Ground cover (%)						Foliage cover		SUM	Score
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees	Shrub		
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU12	Site007	11.10.7	5	5	2.5	2.5	5	1	3	5	5	5	3	2.5	3	47.5	59.38
AU12	Site008	11.10.7	5	5	5	2.5	5	5	5	5	5	5	5	5	3	60.5	75.63
AU6	Site009	11.10.1x1	5	5	2.5	2.5	3	1	5	5	5	5	3	5	3	50	62.50
AU9	Site010	11.10.3	5	5	2.5	2.5	5	3	5	5	10	2	10	5	5	68	85.00
AU11	Site011	HVR 11.10.7	5	2.5	2.5	2.5	4	5	0	5	5	5	3	3.5	5	48	60.00
AU11	Site012	HVR 11.10.7	2.5	2.5	2.5	2.5	5	5	3	5	5	5	3	5	0	46	57.50
AU40	Site013	11.5.9b	5	5	2.5	5	5	1	5	5	5	2	3	4	3	50.5	63.13
AU41	Site014	11.5.9b Disturbed	5	5	2.5	5	5	1	5	5	5	5	5	2.5	3	52	65.00
AU40	Site015	11.5.9b	5	2.5	2.5	2.5	5	1	5	5	5	2	5	2.5	3	54	67.50
AU40	Site016	11.5.9b	5	5	2.5	2.5	5	5	5	5	5	2	5	5	3	54	67.50
AU9	Site017	11.10.3	5	5	2.5	5	5	5	5	50	5	2	5	50	3	59.5	74.38
AU38	Site018	NR 11.5.9b	0	0	2.5	2.5	0	1	3	0	0	0	0	0	3	12	15.00
AU41	Site019	11.5.9b Disturbed	5	5	2.5	2.5	5	3	5	5	5	5	3	2.5	0	48.5	60.63
AU12	Site020	11.10.7	5	5	2.5	5	4	1	3	5	5	5	0	4	3	47.5	59.38
AU12	Site021	11.10.7	5	5	2.5	5	5	5	5	5	5	5	10	4	3	64.5	80.63
AU16	Site022	11.3.1	5	5	2.5	2.5	5	0	3	5	10	2	3	2.5	3	48.5	60.63
AU6	Site023	11.10.1x1	5	5	2.5	2.5	3	5	5	5	0	5	10	4	5	57	71.25
AU40	Site024	11.5.9b	5	5	2.5	2.5	5	1	3	5	5	0	10	5	3	45	56.25
AU40	Site025	11.5.9b	5	5	2.5	2.5	5	3	3	3	5	5	3	5	3	57.5	71.88
AU40	Site026	11.5.9b	2.5	5	2.5	2.5	5	5	3	5	5	5	10	4	3	57.5	71.88

Unit	Site	Regional Ecosystem	Species Richness					Ground cover (%)					Foliage cover		SUM	Score	
			Trees	Shrubs	Grasses	Forbs	Tree height	Native perennial grass	Organic litter	Recruitment (%)	Large trees	Woody debris	Non-native plant cover	Trees			Shrub
<b>Max score</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>80</b>	<b>100</b>
AU9	Site027	11.10.3	5	5	5	5	5	3	5	5	5	2	10	2	3	60	75.00
AU12	Site028	11.10.7	5	5	2.5	2.5	5	5	5	5	5	5	10	2.5	5	64.5	71.88
AU40	Site029	11.5.9b	2.5	5	2.5	2.5	0	5	5	5	5	5	10	5	5	52	65.00
AU6	Site030	11.10.1x1	5	5	2.5	2.5	4	3	3	5	5	2	5	2.5	3	47.5	59.38
AU12	Site031	11.10.7	2.5	5	0	5	5	5	0	5	5	5	10	3.5	5	56	70.00
AU38	Site032	NR 11.5.9b	0	2.5	0	2.5	0	1	0	5	0	2	0	0	5	18	22.50
AU19	Site033	11.3.2	5	5	2.5	2.5	5	1	3	5	5	5	5	2.5	3	49.5	61.88
AU2	Site034	NR 11.10.12	0	2.5	0	0	0	3	0	0	0	5	3	0	3	16.5	20.63
AU23	Site035	11.3.25	5	2.5	0	0	5	0	5	0	10	5	0	5	3	40.5	50.63
AU40	Site036	15.5.9b	2.5	5	2.5	2.5	5	3	3	5	5	5	5	3.5	5	48.5	60.63
AU40	Site037	15.5.9b	2.5	2.5	2.5	2.5	5	3	3	5	5	2	10	2.5	0	54	67.50
AU32	Site038	11.4.9	5	2.5	0	2.5	5	0	5	5	5	5	5	4	5	49	61.25
AU31	Site039	NR 11.4.9	5	5	2.5	2.5	5	1	5	5	5	5	0	3.5	3	47.5	59.38
AU23	Site040	11.3.25	5	5	0	2.5	5	0	5	5	5	2	0	4	3	41.5	51.88
AU34	Site041	NR 11.5.3	5	0	0	2.5	5	0	5	0	5	2	0	5	3	32.5	40.63



Table 19-3 Species specific habitat quality score for the offset site - Glossy Black cockatoo

Site	FORAGING												BREEDING			Mobility			Absence of threats		Baseline			
	<i>Casuarina cristata</i>			<i>Allocasuarina leuhmannii</i>			<i>Casuarina cunninghamiana</i>			Basal area		% of primary food trees		Foraging score	Probability of hollows		% of government mapped habitat likely to contain food trees in 14 km	Score	Fine fuel hazard	Position in landscape	Score	TOTAL	TOTAL of 10	
	Basal 1	Basal 2	Basal 3	Basal 1	Basal 2	Basal 3	Basal 1	Basal 2	Basal 3	Total Basal area	Total Basal area score	% of primary food trees	% of primary food trees score		Number of Eucalypts over 50 cm DBH in BioCon raw	Per hectare	Score							
Offset																								
Site 022	8	16	16	0	0	0	0	0	0	6.66	3	100	5	20	0	0	0	31.4	10	HIGH	MIDSLOPE	7	37	3.7
Site 038	0	0	0	0	0	0	0	0	0	0	1	0	0	15	0	0	0	22.1	10	LOW	VALLEY	25	50	5
Site 039	0	0	0	0	0	0	0	0	0	0	1	0	0	15	0	0	0	22.1	10	MODERATE	VALLEY	18	43	4.3
HQ_B A13	0	0	0	0	0	0	0	0	0	0	1	0	0	15	10	20	10	25.8	10	MODERATE	VALLEY	18	53	5.3
HQ_B A14	0	0	0	0	0	0	0	0	0	0	1	0	0	15	10	20	10	25.8	10	MODERATE	VALLEY	18	53	5.3
HQ_B A15	0	0	0	0	0	0	0	0	0	0	1	0	0	15	6	12	10	23.4	10	HIGH	VALLEY	14	49	4.9
HQ_B A41	0	0	0	0	0	0	0	0	0	0	1	0	0	15	0	0	0	34.4	10	LOW	VALLEY	25	50	5
HQ_B A44	1	0	7	0	0	0	5	1	1	2.5	3	53.33333333	0	15	0	0	0	20.1	10	LOW	VALLEY	25	50	5

## 20 Landscape Scale Assessment

The Queensland Government’s Guide to Determining Terrestrial Habitat Quality version 1.3 specifies that the landscape-scale components of BioCondition are not considered as part of habitat quality for offsets. They are nevertheless to be reported, as position in the landscape must be appropriate for delivering an offset that achieves a conservation outcome. A “moderate” landscape score is required for an offset to be suitable, although the minimum acceptable landscape-scale attribute score is “determined by the administering agency on a case-by-case basis”.

The offset site had a landscape score of 16/20, which was slightly higher than the impact site’s score of 14/20 (**Table 20-1**).

**Table 20-1 Landscape scale BioCondition score**

Landscape Attribute	Impact Site	Offset Site
Size of patch	10/10	10/10
Connectivity	0/5	2/5
Context	4/5	4/5
<b>Total Score</b>	<b>14/20</b>	<b>16/20</b>

For fragmented landscapes, such as those containing the impact site, the following landscape-scale attributes have been assessed:

- Size of patch (area in hectares of any remnant or regrowth vegetation, irrespective of regional ecosystem or tenure, that is connected to the site via corridors wider than 200 m);
- Context (proportion of local region that comprises remnant or regrowth vegetation); and
- Connectivity (the proportion of a site’s perimeter that is connected to remnant or regrowth vegetation).

The methodology used for generating a score out of 20 for the impact site is described in the BioCondition Assessment Manual version 2.2 (Department of Science, Information Technology, Innovation and the Arts , 2015). The landscape-scale attributes will be calculated using data stored in Geographical Information Systems (GIS). Regional ecosystem mapping (remnant) and regrowth (non-remnant) vegetation mapping will be used to assess landscape-scale attributes. Field-verified mapping (surrounding the impact site) is planned to be used in the assessment where it is available. For the remaining portions of the landscape lacking field-verified mapping, certified mapping (version 12.2) downloaded from the Queensland Government QSpatial website will be used.

The methodology used for calculating scores for size of patch and connectivity has followed the BioCondition Assessment Manual version 2. (Department of Science, Information Technology, Innovation and the Arts , 2015). However, the methodology for assessing context is expected to require some adjustment. According to the Guide to determining terrestrial habitat quality version 1.3 (DES, 2020), landscape-scale attributes should be assessed “at the overall site level, rather than at the matter area level”.

## 21 Summary of potential for improvement

Overall, the management of watercourse REs is calculated to improve from 6/10 to 8/10, which rounds to a 2 point increase. The Glossy Black cockatoo habitat area is calculated to improve from 3/10 to 5/10, which rounds to a 2 point increase. RE 11.3.2 is calculated to improve from 5/10 to 7/10, which is a 2 point increase. Therefore, the conservation outcome of achieving a 2-point increase in habitat quality for the matters of interest within the offset area over the 20 year period of management, will be achieved (see **Table 6-1**).

## 22 Expected costs of delivery of offsets

Costs associated with the management measures are subject to a commercially sensitive agreement and cannot be provided, as stated in Section 9.

## 23 Development of management plans

The following management plans will be developed in consultation with DETSI to be implemented as part of the offset area management. These include:

- Revegetation management plan
- Pest management plan
- Weed management plan
- Biomass management plan.

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## **Appendix A**

# **BioCondition and habitat quality calculations for impact and offset site**



## **Appendix B**

# **Impact site and offset set BioCondition and habitat quality data sheet/field assessment**





## Appendix C

### Photographs of offset site



## Appendix D

### Environmental Authority

